Dimplex®

Better solutions through innovation

Owner's Manual

Solar Domestic Water Heating System

Model

ESSW2

ESDW2

⚠ WARNING: This system is designed to be used with Polypropylene Glycol as a heat transfer liquid. Substitution of any other heat-transfer fluid can cause irreparable damage and create a health and safety hazard.

! NOTE: This manual should be kept in the same area as the system for reference purposes.

IMPORTANT SAFETY INFORMATION: Always read this manual first before attempting to install or use this Solar Domestic Hot Water System. For your safety, always comply with all warnings and safety instructions contained in this manual to prevent personal injury or property damage.

To view the full line of Dimplex products, please visit www.dimplex.com

The solar energy system described in this manual, when properly installed and maintained, meets the minimum standards established by the SRCC™. This certification does not imply endorsement or warranty of this product by SRCC™.

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ⓘ Welcome & Congratulations

Dear Customer,

Thank you very much for choosing the our Solar Domestic Hot Water System. We appreciate the choice of products you have had and we want to assure you that the Solar Hot Water System satisfy the highest performance, quality and reliability requirements. When correctly installed, commissioned, operated and maintained we are sure that you will enjoy many years of hot water from your Solar Hot Water System. This document will guide you through all the necessary steps to ensure you will benefit from a long and trouble free service of your Solar Hot Water System. The guide is structured into the following sections:

For the trained installer:

- Installation
- Commissioning
- Maintenance
- Troubleshooting
- Decommissioning

For the user:

- Operation
- Troubleshooting
- Warranty
- Contact Information

The installation, commissioning and maintenance sections of this guide are for the trained installer only. Should any issues arise at any stage, which you do not find sufficiently covered in this document please contact technical service using one of the means detailed below.

Wishing you lots of sunshine,

Your Technical Service Team

Contact us at:

💻 **www.renewables.dimplex.com/contact_us** for Troubleshooting and Technical Support

OR ☎ **Toll-Free 1-888-DIMPLEX** (1-888-346-7539) Monday to Friday 8:00 a.m. to 4:30 p.m. EST

⚠ IMPORTANT INSTRUCTIONS

When using electrical appliances, basic precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Read all instructions before using this appliance.
2. Disconnect all power supplies before performing any cleaning, maintenance or relocation of the unit.
3. Do not modify any of the pumps. Use them only as described in this manual. Any other use not recommended by the manufacturer may cause electric shock or injury to persons.
4. Do not operate the unit with any damaged cords, if any of the pumps have malfunctioned, if the tanks or piping have been damaged in any manner.
5. The Solar Hot Water System is only to be filled in its cold condition. If required, cover the solar collector during installation.

⚠ **WARNING:** High temperatures of solar panels and heat transfer solution may result in scalding!

6. Solar Hot Water Systems can absorb high temperatures. There is a danger of burning! Be careful when installing or inspecting the temperature sensor.
7. Consult the MSDS sheets or Safety Data Sheets for information on the heat transfer solution before filling or draining the system.
8. Installers of this product should follow guide lines for safety for proper transportation and manipulation of the solar collector on/to the roof set out by Local Health and Safety Acts.
9. Only a trained and competent person should install this system.
10. Dimplex does not accept any liability for damage done to persons or property resulting from undue handling and usage of this product.
11. All regulations current at the time of installation are to be considered alongside the content of this manual as they form the code of best practice.
12. It is the responsibility of the Owner/Installer to ensure that the transport, storage, installation and operation of the product is carried out in a safe manner.
13. When making the piping connections, make sure that connecting pipe work is not mechanically over-stressed. Over time this could cause breakages, with consequent liquid losses which, in turn, could cause harm to property and/or people.

SAVE THESE INSTRUCTIONS

Disclaimer

The information presented in this manual was correct at the time of print and was prepared with the greatest diligence and care possible. The manufacturer does not take any responsibility for damage done to property or life by not adhering to the instructions given in this guide. The right is reserved to introduce technical alterations without prior notice as part of the company's continuous improvement measures. All personnel specifying or designing the use of this equipment, installing, operating or maintaining it must be appropriately trained or instructed and must follow the procedures laid out in this guide and other related and relevant literature including standards and regulations.

Always use a qualified technician or service agency to repair this system.

! **NOTE:** Procedures and techniques that are considered important enough to emphasize.

⚠ **CAUTION:** Procedures and techniques which, if not carefully followed, will result in damage to the equipment.

⚠ **WARNING:** Procedures and techniques which, if not carefully followed, will expose the user to the risk of fire, serious injury, or death.

🕮 Quick Reference Guide

Component Check List

Kit Components

Part Number	Description	ESSW2 Qty	ESDW2 Qty
DSCA-2M	SOLAR COLLECTOR, DIMPLEX, FP BLUE-A, 2M	2	2
MK-DSCA	MOUNTING KIT, 1 X DSCA	2	2
NA12142	FITTING, UNION, COMPRESSION 3/4”	2	2
254752	FITTING, ELBOW, COMPRESSION 3/4" THREADED	2	2
DSTA-200	STORAGE TANK, DIMPLEX, SOLAR HX, 53GAL/200L	1	1
9702900	EXPANSION TANK, SOLAR LOOP, 6.6GAL/25L	1	1
45111.5 NA	CONTROLLER, MEIBES, SOLAR-A	1	1
8400410100	WIRE, CONNECTION, 6FT (1.8M)	1	1
4100170200RP	CORDSET	1	1
45722.1 NA	PUMPING STATION, MEIBES, SOLAR LOOP-A	1	1
45411.30 NA	PUMPING STATION, MEIBES, HXA	N/A	1
1002540100	BRACKET, PUMP MOUNT	1	1
NA12141	FITTING, END-STOP, COMPRESSION	2	2
7611000	MOUNTING BRACKET, EXPANSION TANK, SOLAR LOOP-A	1	1
5400250100	EXPANSION TANK, HX-A 0.5GAL/2L	N/A	1

Optional Additional Components

Part Number	Description	Qty	Qty
DGA-25	POLYPROPYLENE GLYCOL, DOWFROST, 6.6GAL/25L	1-2*	1-2*
NA3520-15	FLEXTUBE SET, INSULATED 1/2" WITH SENSOR WIRE - 50 FT/15M	1	1
NA12102	FITTING, FLEXTUBE, 3/4"	8 min..**	12 min..**
NA12133	MOUNTING BRACKET, FLEXTUBE, SET OF 4	1	1

* Depending on pipe length
** Depending on number of connectors
NOTE: Reference to “A” in Description indicates that in larger systems multiples of these components may be used.

General requirements

- Electrical Water Heater tank, 50 gal (184L)

! **NOTE:** Water heater must have adequate capacity, listed and labeled by an accredited listing organization.

- Competent person must install this system.
- Improper operation/installation of the unit could invalidate the warranty.

! **NOTE:** It is recommended that any systems with hard water have a water softener installed in line before the Solar Hot Water System to prevent calcium build up and reduced performance of the system.

- A predetermined location for the installation of the Solar Storage Tank and Solar Collectors.
- Tempering mixing valves, to avoid burns, are required at the outlet of the existing water heating system or at each faucet.
- All electrical installations must be grounded.
- Make sure all piping and all equipment is clean before filling or flushing (a non-foaming detergent may be used in the Solar Hot Water System, e.g. TSP) - See Commissioning Section.
- Carefully follow the instructions and labels during the connection of the units.

🕮 General Operating Information

With the increasing concern for the health of our environment and the awareness to reduce our carbon emissions, the need to use alternative sources of energy is becoming more important. Using a Solar Domestic Hot Water System will assist with that and reduce your household heating costs throughout the year. The Dimplex® Solar Domestic Hot Water System has received US Energy Star Rating Certification.

The Dimplex® Solar Domestic Hot Water System uses heat transferred from the sun to specifically designed solar collectors, with high efficiency coils to fully optimize the heat transfer, which are located on your roof or any other southern facing surface. The panel attracts the sun's rays and traps them under a thick solar collector glass, increasing the temperature of copper tubing, which is coiled from top to bottom and heats the polypropylene glycol mixture which is being pumped through them, by a Solar Pumping station.

The Solar Pumping station, located within the same area as your existing water heater, is a self contained unit, equipped with a variable speed pump to adjust the heat transfer speed within the collection panels. The Solar Pumping station allows the user to monitor: the input and output temperatures of the polypropylene glycol with temperature measurement dials; the operating pressure of the system; and the flow rate of the glycol on a variable area rotameter. As a safety consideration the pumping station is equipped with a Solar Loop Expansion Tank and a pressure release valve to compensate when the temperatures within the system reach maximum capacity.

The Dimplex® Solar Domestic Hot Water System comes in two different configurations, for heat transfer, depending on Local plumbing code requirements: a Single Wall; and a Double Wall System.

In Single Wall Systems, the polypropylene glycol is then pumped directly from the Solar Collectors and circulated through a heat transfer coil located in the Solar Storage Tank to heat your household potable water.

In Double Wall Systems, the polypropylene glycol is then pumped through a cross flow Solar Pumping Station - HXA, transferring the heat from the glycol to Distilled water. The distilled water is then circulated in a coil located in the Solar Storage Tank to heat your household potable water.

The glass lined steel Solar Storage Tank is constructed with 2.4" (60mm) of insulation to reduce the amount of heat loss and contains a heat transfer coil to maximize the transfer of solar energy to the water.

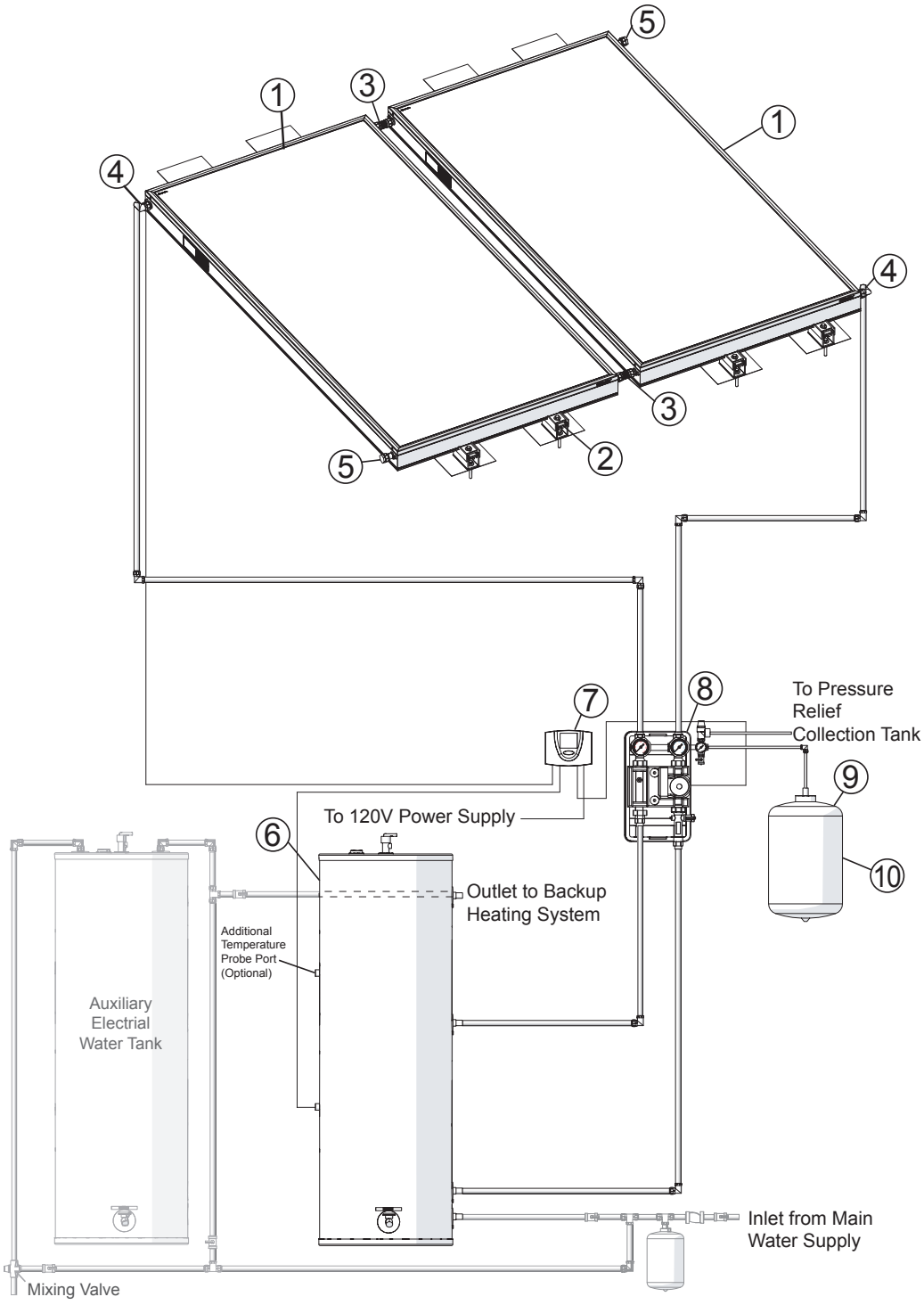
This Solar Hot Water System is controlled by comparing two temperature probes within the system: one measuring the temperature at the outlet of the Solar Collectors and one measuring the temperature of the water located in the bottom of the Solar Storage tank. As the temperature fluctuates, between the temperature probes, the circulation pumps will turn on and off to transfer the fluid throughout the system and heat the water within the Solar Storage Tank, to the desire temperature.

The Solar Hot Water System is used in conjunction with your existing system (Back-up). When the solar collectors are unable to provide sufficient heat to reach set temperatures, your existing system will supplement the generation of heat to obtain the desired setpoint.

As an additional ability both the Solar Pumping station and the HXA Pumping Station are engineered with a flush and fill ability. Where a portion of the circuit can be blocked and a external pumping station can be attached to fill or drain that particular circuit, without having to go on to the roof.

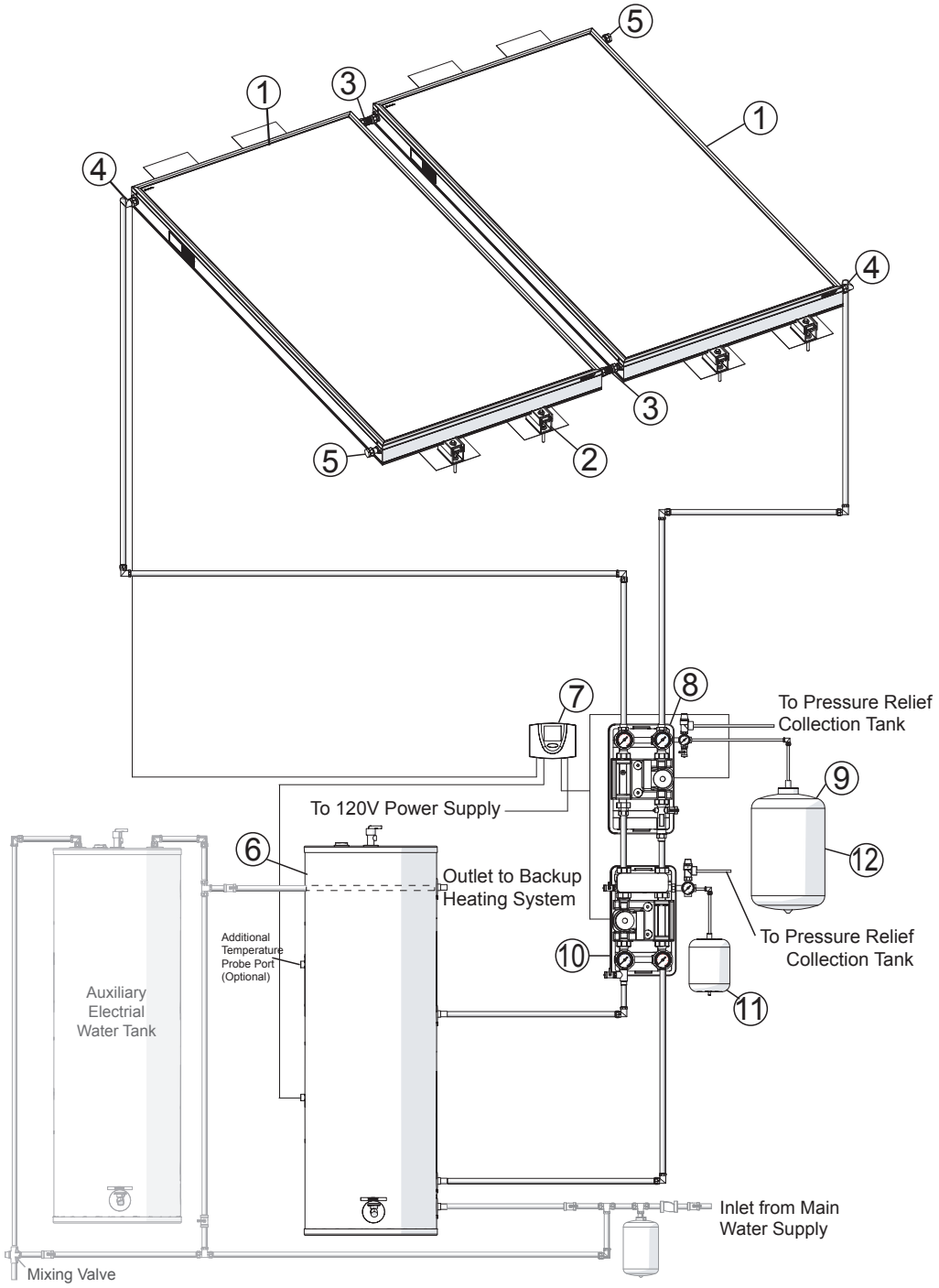
🕮 General Operating Information

Single Wall Heating System


To Pressure Relief Collection Tank
To 120V Power Supply
Outlet to Backup Heating System
Additional Temperature Probe Port (Optional)
Auxiliary Electrial Water Tank
Inlet from Main Water Supply
Mixing Valve

1. Solar Collectors
2. Mounting Brackets
3. Straight Flexible Compression Fitting
4. Elbow Compression Fitting
5. Plug Compression Fitting
6. Solar Storage Tank
7. Solar Controller
8. Pumping Station - Solar Loop-A
9. Expansion Tank - Solar Loop

Double Wall Heating System


To 120V Power Supply
To Pressure Relief Collection Tank
Outlet to Backup Heating System
To Pressure Relief Collection Tank
Additional Temperature Probe Port (Optional)
Auxiliary Electrial Water Tank
Inlet from Main Water Supply
Mixing Valve

1. Solar Collectors
2. Mounting Brackets
3. Straight Flexible Compression Fitting
4. Elbow Compression Fitting
5. Plug Compression Fitting
6. Solar Storage Tank
7. Solar Controller
8. Pumping Station - Solar Loop-A
9. Expansion Tank - Solar Loop-A
10. HXA Pumping Station (ESDW2 Only)
11. HXA Expansion Tank (ESDW2 Only)

🕮 Site Selection and Preparation

Prior to installation of a Domestic Solar Hot Water System Local Building Codes, Zoning Ordinances, Subdivision covenants and any other special regulations pertaining to the site should be consulted.

To find out what's needed for local compliance, contact the following:

Your local jurisdiction's zoning and building enforcement divisions

- Briefly describe your intended construction, asking for other relevant ordinances/codes that might be in effect.
- Find out if there are any additional local amendments or modifications to the regulations in effect.
- Ask how to determine whether you are located in a historic district, flood-plain area, or any other special category regulated by a government body.
- Ask where you may find pertinent ordinances/codes (local library, government office, etc.).
- Read pertinent sections of the regulations, making photocopies of information you wish to file for future review and design/installation analysis.

Homeowner's, subdivision, neighborhood, and/or community associations

- Ask if they have any ordinances, provisions, or covenants that may affect the design and installation of the system.
- Copy and file pertinent sections for reference.

City or Municipal Offices

- Required Building Permits and associated Inspections.

Location Considerations:

- You have determined the best south facing roof/mounting surface with no or minimum shading during the day. For maximum efficiency the solar collectors should be installed in a location where they can receive 8 hours of sunlight per day.
- The Solar Collector mounting surface is rated to withstand the weight of the components as well as the Fluid.
- The condition of the mounting surface has been considered, i.e. the replacement of the shingles would result in the need to remove and reinstall the panels.
- You have allocated enough space for the Solar Hot Water System installation in the same location as you current water heating system.
- The age of the current water heating system

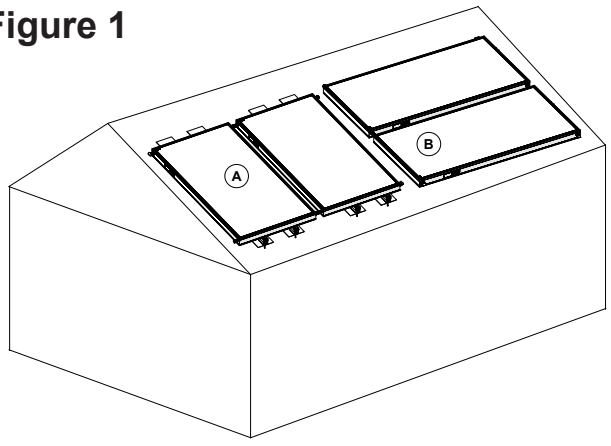
System Considerations:

- Your household main supply of potable water is supplied to your water heating system in accordance to applicable Plumbing Codes and Standards.
- You have installed your auxiliary electrical storage heating system to achieve standard temperatures to applicable Plumbing Codes.
- Electrical requirements are in accordance to Local and National Electrical Code.
- A mixing or tempering valve is present or needs to be added.
- Local plumbing code has been consulted to determine if additional plumbing is required on the domestic water supply.
- The geographical location of the installation to determine the appropriate solution required for the system, to ensure that freeze tolerance limits are appropriate.

GENERAL INTRODUCTION FOR SOLAR COLLECTOR INSTALLATION PLANNING

Solar collectors can be installed in various ways. Consideration in the installation should include:

Figure 1



- Available solar radiation
- Seasonal usage of the energy demand
- Ease of installation
- Aesthetic impact

The following suggested installation orientations of the solar collectors are shown in Figure 1.

⚠ **CAUTION:** Location considerations should ensure that building materials adjacent to the solar components are not exposed to the elevated temperatures of the system.

⚠ **CAUTION:** Ensure that solar collectors will not be susceptible to excess shading. For maximum efficiency the solar collectors should be installed in a location where they can receive 8 hours of sunlight per day.

The Dimplex Solar Hot Water System is specifically designed for shingle or steel roof mounting. The recommended fixing options are summarized in the Table 1.

❗ **NOTE:** There are some installations the are not recommended, due to the specifics of this system.

Table 1: Dimplex Solar Collector Recommended Installation

Installation option		*Availability*
A	Sloped roof vertical	Yes
B	Sloped roof horizontal (top)	Yes

Option A and B: Available with standard mounting kit for Solar Collector ESSW2 OR ESDW2.

PIPING ROUTING PLAN

Once the location of your Solar Collectors has been decided, the routing of the piping to connect the two areas can be planned. Piping can be led either inside or outside of the house.

⚠ **CAUTION:** Ensure that any penetrations through fire-rated assemblies do not reduce the fire resistance below code.

Inside piping considerations:

- The piping will not be visible on the surface of your house and only the Solar Collectors will be visible on the roof.
- A roof sealing kit will be required.
- Routing of the pipe inside of the attic in direction of storage heater installation place.

Outside piping Considerations:

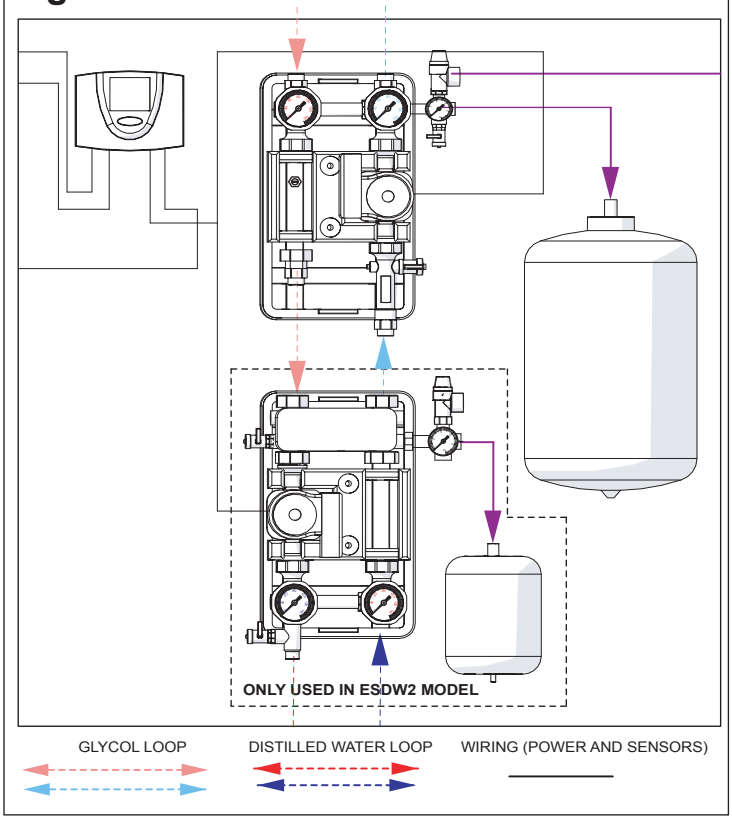
- The pipe will be visible on top of your roof.
- Ease of installation and any possibility of leakage into the house will be avoided.

SYSTEM INSTALLATION AREA

The location of the Solar Controller, pumping system and storage tanks can be planned in the same location as your current water heating system. The Dimplex Solar Hot Water System will require an area, in the same area as your current water heating system, which will allow for the 24” (61cm) diameter Solar Storage Tank with approximately 6” (15.2cm) diameter additional clearance, to enable easy access to monitor the system.

It is recommended that an area of wall in the same area is available for mounting the pumping components and controller. Consideration should be taken to ensure that it can withstand the weight of the components and fluids. If this is not available, the components can be mounted on a plywood

Figure 2



board or a “mounting wall”.

For the double wall system installation the wall area required is approximately 4’ x 4’ (122 cm x 122 cm).

For the single wall system installation the wall area required is approximately 2’ x 4’ (61 cm x 122 cm).

⚠ **CAUTION:** Protection against auto-ignition of combustibles: Combustible materials used in soar equipment and adjacent structures shall not be exposed to an elevated temperature that could cause ignition.

⚠ **CAUTION:** Access to the Solar Controller, pressure relief valves and the connecting cables must be ensured, for monitoring and maintenance of the system.

Consideration of the location of the unit should also allow for a 120V GFI receptacle to be located in the same vicinity to allow for the Solar Controller to be plugged in.

Installation Instructions

The Dimplex Solar Domestic Hot Water System is designed to be installed in series to your existing potable water heating system.

⚠ **WARNING:** This system is to be installed in accordance to Local Building Codes, Electrical Codes and National Roofing Contractors Association while following State/Provincial Health and Safety Standard practices.

! **NOTE:** The Overall layout of the system can be found in the General Operating Information Section of this manual.

! **NOTE:** For space allocation requirements see the Site Selection and Preparation section of this manual.

Solar Collectors

⚠ **WARNING:** Appropriate lifting practices and appropriate Health and Safety equipment are to be used to ensure safe transporting and installation of the solar collectors.

⚠ **CAUTION:** Tempered glass will shatter if handled inappropriately.

⚠ **WARNING:** Due to the nature of the components it is suggested that the panels be covered, during installation, to reduce the amount of heat transfer occurring on start up and commissioning.

The Solar Collectors come with an installation kit (Figure 3) which includes all of the components required to mount and seal the two solar collectors to the trusses on any roof. Figure 10 shows the typical vertical installation, although the solar collectors can be mounted horizontally, as long as the outlet is connected at the highest point.

⚠ **CAUTION:** The installation should not impair the enclosure function of the building.

⚠ **CAUTION:** Ensure that all penetrations into the building and all connections are resistant to vermin.

! **NOTE:** Instructions are included to mount the solar collectors to a support bracket located below the trusses but longer bolts will be required (not included).

! **NOTE:** Consult Local building codes as to the type of installation that will be required.

For Mounting Collectors Directly to Trusses (Figure 5A)

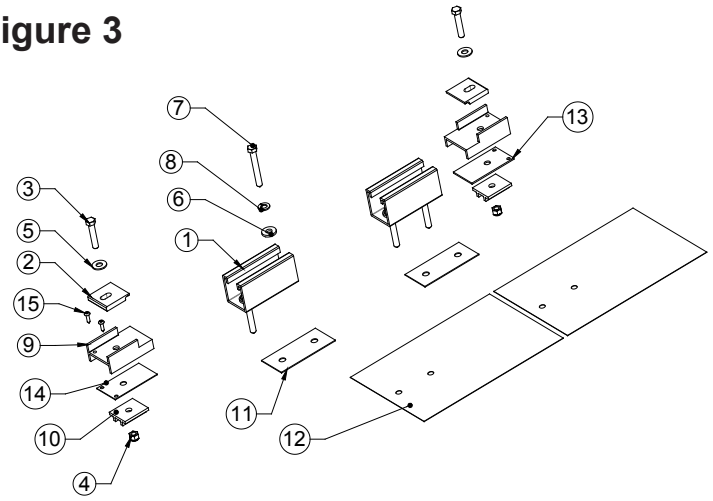
⚠ **CAUTION:** Ensure that the structural members that are being penetrated by the Solar components meet code.

1. On the surface where the solar collectors are to be located, locate 5 studs, and mark their centers.

! **NOTE:** The middle stud is not used in the installation.

2. Install the flashing under the shingles, lining up holes in flashing to centers of the studs and line up bottom of flashing with bottom of the shingle. (Figure 4)
3. Using the flashing as the template drill pilot

Figure 3



ITEM NO.	DESCRIPTION	Mounting Kit/QTY.
1	RAIL	4
2	CLAMP TOP	4
3	BOLT HEX STAINLESS STEEL 3/8" -16 GRADE 5	4
4	3/8" - STAINLESS STEEL NYLON INSERT LOCKNUT	4
5	3/8" STAINLESS STEEL WASHER	4
6	3/8" STAINLESS STEEL BONDED EPDM WASHER	8
7	SCREW LAG STAINLESS STEEL HEX 3/8" -3"	8
8	3/8" SS LOCK WASHER	8
9	SUPPORT CLAMP	4
10	CLAMP BOTTOM	4
11	GASKET	4
12	FLASHING (Not required for Steel Roofs)	4
13	SHIM 0.1" (2.54mm)	2
14	SHIM 0.05" (1.27mm)	2
15	10-16x3/4 SS SELF DRILLING SCREW	4

Figure 4

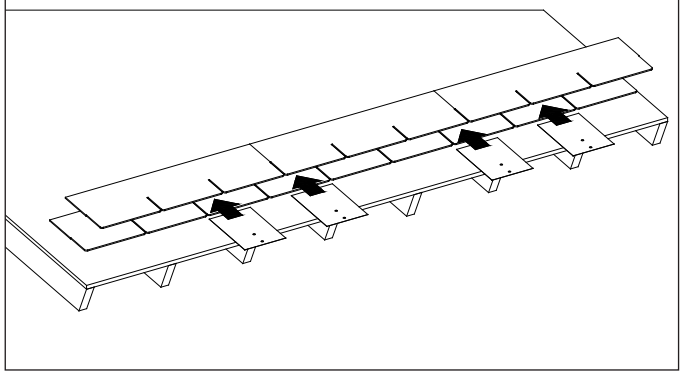


Figure 5

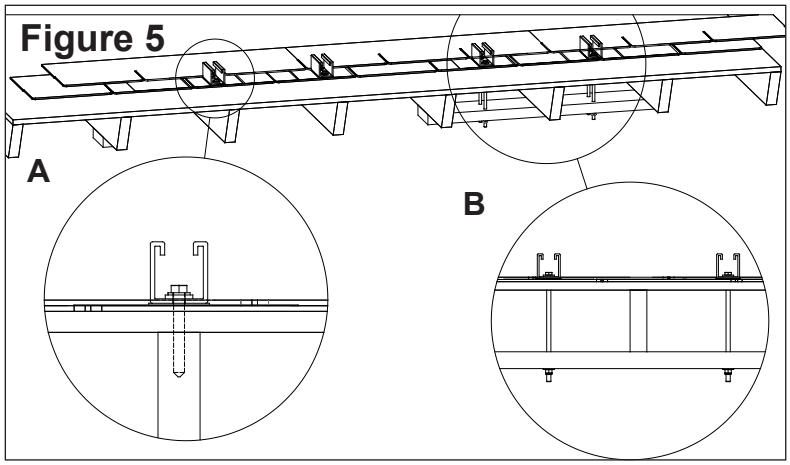


Figure 6

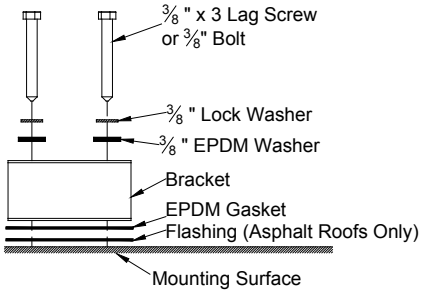


Figure 7

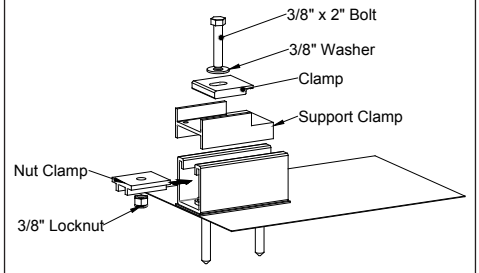
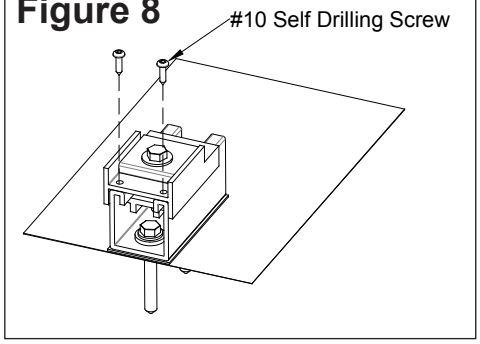


Figure 8



holes using a 5/16” drill bit.

! NOTE: The flashing can be used as a template for steel roofs but is not required as part of the installation. Flashing is required on asphalt roofs to prevent water penetration.

4. Install brackets using (2) 3/8” x 3” lag screws, lock washer, EPDM washer, Bracket and EPDM Gasket for each mounting location. (Figure 5)

Continue to Step 9.

For Mounting Collectors to Support Bracket (Figure 5B)

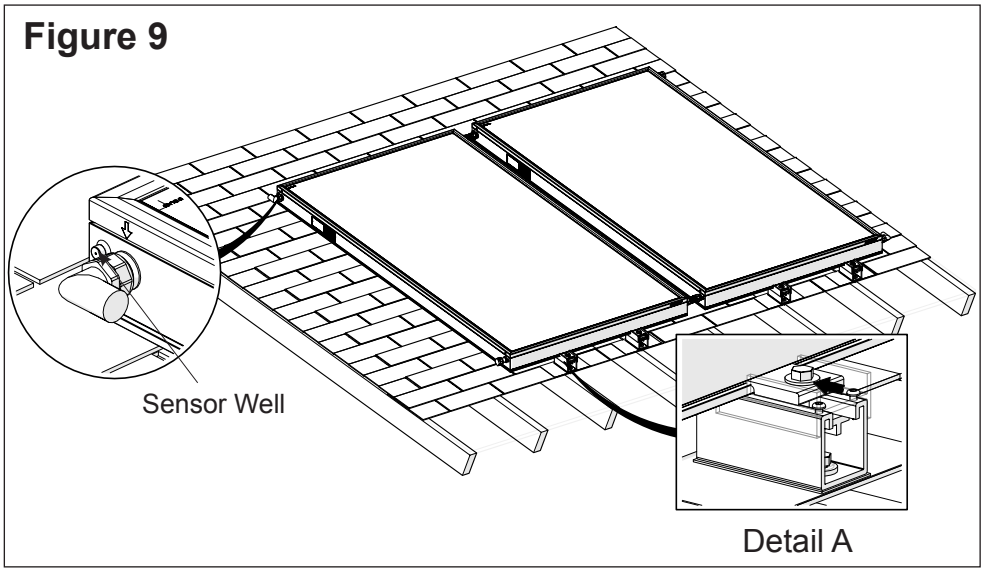
⚠ CAUTION: Ensure that the structural members that are being penetrated by the Solar components meet code.

1. Inside the roof, measure the distance across 3 trusses (from the outer most points).
2. Cut a 2” x 6” piece of wood corresponding to the measured length.
3. Mark the on the board, 3 marks that divide the board into 4 equal sections.
4. Line up the flashing center on the two outside marks and using the flashing as a template, mark and drill 3/8” holes for the bolts to pass through.
5. On the outside surface, where the solar collectors are to be located, locate the corresponding 3 studs and mark the center points between them.
6. Install the flashing under the shingles, lining up the hole in the flashing to the marks on the roof. (Figure 4).
7. Using the flashing as the template drill 3/8” holes for the bolts to pass through.

! NOTE: The flashing can be used as a template for steel roofs but is not required as part of the installation. Flashing is required on asphalt roofs to prevent water penetration.

8. Install brackets using (2) 3/8” x Bolt, Lock Washer, EPDM Washer, Bracket and EPDM Gasket for each mounting location. (Figure 6)
9. Assemble the clamping assemblies (Figure 7) then insert them into the support brackets and tighten to 35 lbs (15.9kg) of torque.
10. Measure up 75.5” (191.8cm) and repeat Steps

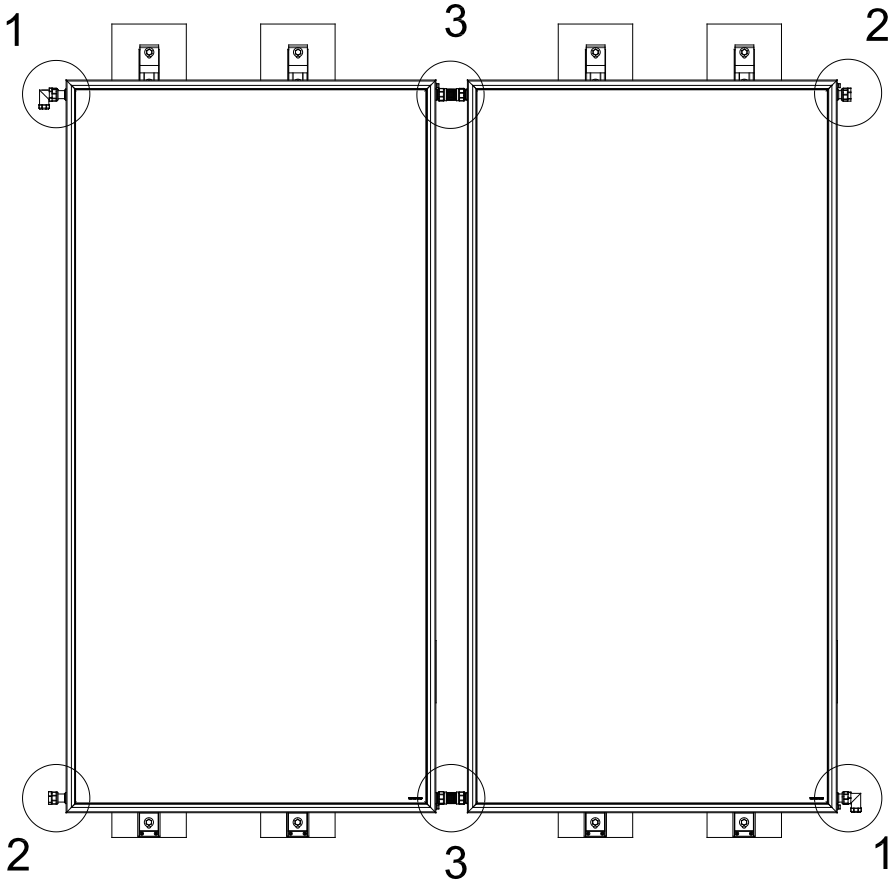
Figure 9

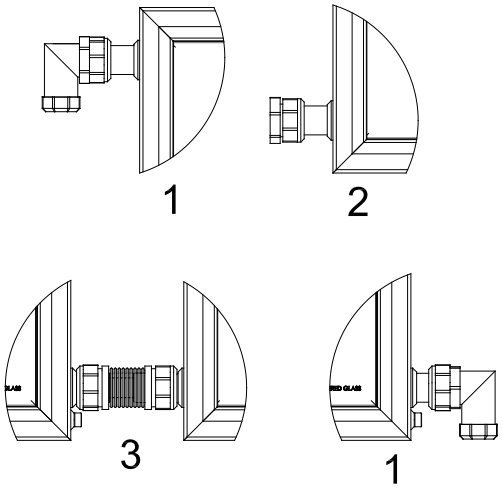


1-4 for assembly of the top mounting assemblies.

11. Assemble the clamping assemblies (Figure 7) then insert them into the support brackets and tighten only to hold in place.
12. Place each Solar Collector on clamp assemblies, so that the sensor wells are located on the outside of the assembly and the clamps are securely resting on the brackets.
13. Connect the solar collectors together, using the provided Stainless Steel flexible connectors, Figure 10, which will allow for expansion and contraction due to changing weather conditions and install

Figure 10





! **NOTE:** Plumbing connections and plugs can be reversed, as long as the outlets are located at the top of the panels.

! **NOTE:** Only use the sensor well that is closest to the outlet.

the threaded plugs in the unused ports.

NOTE: There are two different thickness of shims provided to assist with ensuring that the collectors are level and connections are sealed properly.

14. Once the solar collectors are level and plumbed together, secure the bottom clamp assemblies, using #10 self drilling screws. (Figure 8)
15. Loosen the bolt in the bottom clamp and slide into groove of the solar collector and tighten to 35 lbs (15.9kg) of torque (Figure 9 - Detail A).
16. Repeat Steps 11-15 for the top clamp assembly.

CAUTION: Ensure that the final installation of the collectors is capable of maintaining tilt and azimuth.

17. Install the elbow connector at the Solar Collector inlet and outlet. (Figure 10)

Piping

Two lines of 1/2” (12.7mm) piping, insulated to R4.2 with UV resistant EPDM insulation, need to be run from the Solar Collectors to the pumping system. The lines can run either through the walls/attic of the house or along the outside wall of the house. Any piping that is required to run across a surface horizontally should be sloped towards the drain ports with a drainage slope of no less than 3/4” (20mm) vertical drop for each meter of horizontal length (1/4”/ft).

NOTE: Stainless steel corrugated pipe is suggested for use but standard insulated potable compliant piping can be used.

NOTE: Stainless steel corrugated piping is available as an optional accessory, in 50’ (15.24m) lengths, with sensor wire and insulation.

NOTE: If soldering rigid connections, ensure soldered connections meet potable water requirements and can withstand high temperatures.

NOTE: Tag the inlet and outlet of the piping at each end to help with installation.

The Stainless steel corrugated piping is equipped with a sensor wire that can be attached to the Solar Controller and the temperature probe at the Solar Collectors. If using an alternative piping, double insulated 20 ga two core sensor wire can be used and should be covered with the UV resistant insulation, with a minimum rating of R-4.2, to protect the wire from environmental elements and vermin.

NOTE: When running piping ensure that the pipe is supported properly to prevent any sagging or stress on any other component of the system, and has been installed with the correct pitch to allow for proper drainage.

CAUTION: When installing piping supports ensure that the insulation is not pinched or compressed, which may damage or reduce the life of the insulation and subsequently the piping.

In the Sensor wells, in the Solar Collectors, there is a rubber gasket.

- Remove the gasket and insert the probe through the gasket.
- Insert the probe into the sensor well so that the probe gently touches the end of the well.
- Move the gasket so that it seats back into the well and secures the temperature probe.

CAUTION: Flashing, sealing and routing for the piping and sensor wire is the responsibility of the installer and is not included in the kit.

When running piping from Solar Collectors to Pumping Stations ensure that the vertical runs of piping are supported at a minimum every 10ft (3m).

Solar Pumping Station - Solar Loop-A

WARNING: Always completely disconnect the device from the power supply before performing maintenance or electrical work.

WARNING: Do not make any changes to electrical components, the design or the hydraulic components to prevent risks or harm to people or material property.

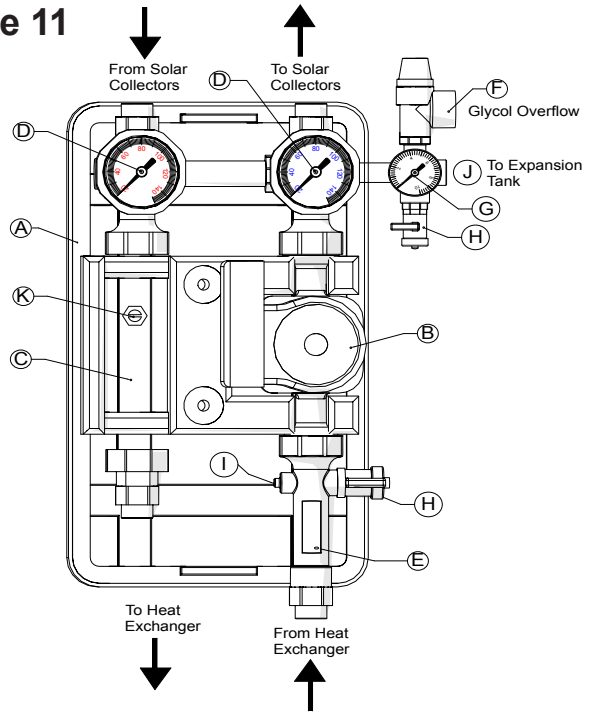
WARNING: Wiring procedures and connections should be in accordance with the National Electric code (NEC) and local codes

⚠ CAUTION: The pumping stations described are to be operated as described in these instruction with the recommended solar heat transfer liquid. (See Heat Transfer Liquid Section for specific information)

⚠ CAUTION: Do not make any changes to electrical components, the design or the hydraulic components. Any other use not recommended by the manufacturer may cause electric shock or injury to persons.

⚠ WARNING: Improper ventilation will result in pressure loss and can cause malfunctions in the Solar Hot Water System. The temperatures of the leaking air and the heat transfer medium may be higher than 140°F (60°C). Therefore, there is a risk of scalding. The vent is located at the highest point of the system. Once the system has been carefully and properly ventilated, the system pressure must be increased to the operating pressure again.

Figure 11



A. Insulation Housing
B. Circulation Pump
C. Air Separator
D. Temperature Dials & Shut-off Ball Valves with built-in Check Valves
E. Volume Flow Indicator
F. Pressure Relief Valve and Discharge Pipe
G. Pressure Gauge
H. Flush and Fill Connections
I. Isolating Ball Valve
J. Expansion Tank Connection
K. Air Separator

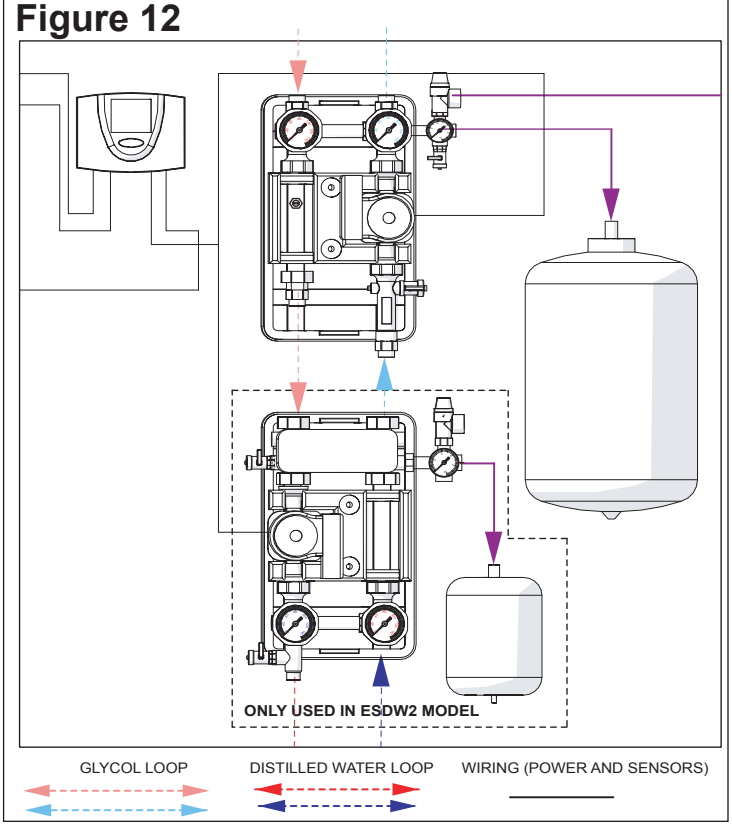
The Solar Pumping Station - Solar Loop-A is delivered as a preassembled system. The expansion tank and pressure relief valves are included as separate components and installation instructions can be found in the corresponding sections.

The unit is comprised of: a 3-way directional distributor that incorporates a manually adjustable non-return and isolating ball valve together with an over pressure relief valve (87 psi/6 bar) (Figure 11F); a connection point for a solar rated expansion tank (Figure 11J); an isolating ball valve, that is fitted above the volumetric flow meter (Figure 11H), complete with flow and return filling points with dedicated isolating ball valves for system commissioning purposes; the 'flow' line incorporates a further manually adjustable non-return and isolating ball valve at the temperature head and also features a permanent 'air separator' (Figure 11C); and a 2 part EPP insulated cover.

The system must be installed on a load-bearing wall, in a dry location. The location, relative to the HXA Pumping station, will be dependant on the type of piping used to connect the two pumping stations together.

Specifications for Pumping Station - Solar Loop-A		
Connections	Solar circuit for expansion tank	3/4" MNPT
		3/4" MNPT
Thermometer	Display Range 70 - 300 °F (20 - 150 °C)	
Pressure Gauge	Display Range 0 - 150 psi (0 - 10 bar)	
Pressure Relief Valve	Activation Pressure 87 psi (6 bar)	

Figure 12



⚠ **CAUTION:** Hazards caused by neighboring building components, electrical, gas, water, or heating pipes must be prevented.

1. Select the installation location. Refer to Figure 12 for recommended layout.

❗ **NOTE:** Access to the Solar Controller, pressure relief valves, and the connecting cables must be ensured.

2. Align and mark the mounting holes using the back insulation shell.
3. Drill mounting holes and install wall anchors, if necessary.

❗ **NOTE:** Run electrical cables through the outer insulation access holes in the back insulation shell before mounting unit to wall.

4. Secure the insulation shell and mounting bracket to the wall and into the mounting holes.

⚠ **CAUTION:** Connect all piping and ensure there are no leaks before making any electrical connections.

5. Connect the Solar Collector piping to the top portion of the Solar Pumping Station (Figure 11).

❗ **NOTE:** Instructions for piping connections to the HXA Pumping Station unit can be found in the HXA Pumping Station installation section, if applicable.

6. The Solar Pumping station requires two additional components to ensure safe and hazard free operation:
   - Expansion Tank - See Solar Loop Expansion Tank section for Installation Instructions.
   - Pressure relief collection container - It is recommended to have a container 0.26 gal (1L) in size - Installer Supplied.

❗ **NOTE:** The pressure relief valve is factory set to 87 psi (6 bar).

⚠ **WARNING:** The liquid in both of these containers can be hot and the risk of scalding will be present. When choosing the type of piping and collection container this should be taken into account.

⚠ **WARNING:** The liquid being collected is high pressure and high temperature polypropylene glycol and all associated safety precautions should be exercised.

⚠ **CAUTION:** To operate the system, the Flush and Fill ball valves must be completely closed (Figure 11H) - See Commissioning Section for additional operational instructions.

⚠ **CAUTION:** Refer to tank labels and valve labelling for proper fluid flow directions.

7. See Solar Controller Installation section for Wiring Instructions.
8. Install the provided insulating cover onto the solar pumping station.

❗ **NOTE:** Ensure all connecting piping is insulated to reduce heat loss.

Solar Loop Expansion Tank

The Solar Loop Expansion Tank is an important safety component to the Solar Domestic Hot Water System. As the temperature of the Polypropylene Glycol increases the volume does as well, the Solar Loop Expansion Tank compensates for this

change. When deciding on the location for this component, the continuous fluctuations in volume/ weight needs to be taken into consideration, as the volume/weight of the tank will change throughout the day.

⚠ **CAUTION:** To ensure the maximum life of the Solar Loop Expansion Tank do not use a solution with a higher concentration than 50% v/v polypropylene glycol. If a higher concentration is required due to the area in which you live, an alternative Expansion Tank is suggested with a diaphragm with a higher concentration rating.

1. Determine the general location for mounting the Solar Loop Expansion Tank, ensuring that it is a close as possible to the Solar Pumping Station.

! **NOTE:** The location, relative to the Solar Pumping station, will be dependant on the type of piping used to connect the tank to the pumping station.

⚠ **CAUTION:** When installing ensure that no additional loads are applied to pipelines or equipment.

2. Mark the location of the mounting holes.
3. Drill mounting holes and install wall anchors, if necessary.
4. Included with the tank is a mounting bracket (Figure 13) to mount the tank to the wall off of the floor. Secure the bracket with screws to the mounting surface.
5. Mount the tank in the bracket, ensuring that the mounting bracket is located between the two protruding lines on the tank.

! **NOTE:** The tank should be mounted so that the outlet is at the top for proper operation.

6. Secure the bracket by tightening the gear clamp on the screw.
7. Connect with piping the Solar Loop Expansion Tank connection on the Solar Loop Pumping Station (Figure 11J)

Figure 13

⚠ **WARNING:** The liquid being collected is high pressure and high temperature polypropylene glycol, all associated safety precautions should be exercised.

Solar Heat Transfer Liquid

⚠ **WARNING: READ SAFETY DATA SHEETS / MSDS DATA SHEETS BEFORE HANDLING LIQUID. FOLLOW ALL PERSONAL PROTECTION AND HANDLING AND STORING REQUIREMENTS.**

⚠ **WARNING: This system is designed to be used with Polypropylene Glycol as a heat transfer liquid. Substitution of any other heat-transfer fluid can cause irreparable damage and create a health and safety hazard.**

⚠ **WARNING: The transfer liquid can reach or exceed temperatures of 60°C/140°F and poses the risk of scalding.**

To ensure maximum heat absorption into the Solar Water Heat Transfer system it is suggested that a Polypropylene Glycol solution of 50% by volume with water with liquid inhibitors is used for areas where the average freezing temperature does not exceed 30°F (-34°C). Any solution that is used in the system is recommended to be GRAS compliant. Dimplex offers a Polypropylene Solution that is 50% v/v which will be appropriate for most installations, the MSDS sheet is attached in Appendix 1, for reference.

! **NOTE:** Document the manufacturer and type of the Solar Heat Transfer solution, because under certain circumstances, the solar fluid should not be mixed with agents from other manufacturers.

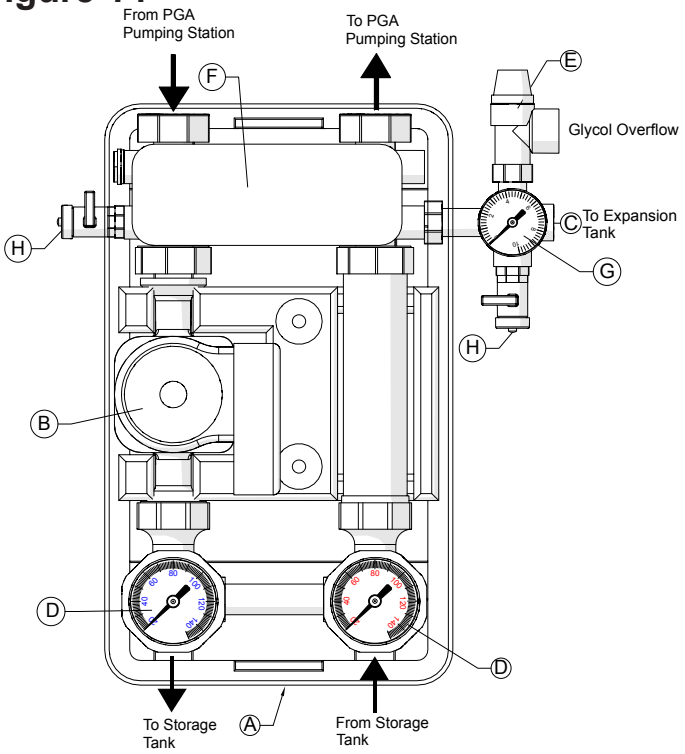
⚠ **CAUTION:** To ensure the maximum life of the Solar Loop Expansion Tank do not use a solution with a higher concentration than 50% v/v polypropylene glycol. If a higher concentration is required due to the area in which you live, an alternative Expansion Tank is suggested with a diaphragm with a higher concentration rating.

⚠ **CAUTION:** Ensure the liquid has an adequate antifreeze content.

⚠ **CAUTION:** Freeze tolerance limits are based

upon an assumed set of environmental conditions. Extended periods of cold weather, including ambient air temperatures above the specified limit, may cause freezing in exposed parts of the system. It is the owner's responsibility to protect the system in accordance with the Supplier's instructions (see Operation Section) if the air temperature is anticipated to approach the specified freeze tolerance limit.

Figure 14



A. Insulation Housing
B. Circulation Pump
C. Expansion Tank Connection
D. Temperature Dials & Ball Valves with built-in Check Valves
E. Pressure Relief Valve and Discharge Pipe
F. Flat Plate
G. Pressure Gauge
H. Flush and Fill Valves

Pumping Station - HXA (Only for use in Double Wall Systems)

⚠ **WARNING:** Always completely disconnect the device from the power supply before performing maintenance or electrical work.

⚠ **WARNING:** Do not make any changes to electrical components, the design or the hydraulic components to prevent risks or harm to people or material property.

⚠ **WARNING:** Wiring procedures and connections should be in accordance with the National Electric code (NEC) and local codes

The HXA Pumping Station comes preassembled. The system must be installed on a load-bearing wall, in a dry location. The location, relative to the Solar Pumping station, will be dependant on the type of piping used to connect the two pumping stations together.

The HXA Pumping Station transfers the heat from the Polypropylene Glycol to Distilled water that circulates through the Solar Storage Tank.

! NOTE: Access to the Solar Controller, pressure relief valves and the connecting cables must be ensured.

1. Select the installation location. Refer to Figure 12 for recommended layout.
2. Align and mark the mounting holes using the back insulation shell.
3. Drill mounting holes and install wall anchors, if necessary.

Specifications for HXA Pumping Station		
Connections	Solar circuit (Primary)	3/4" MNPT to Solar Storage Tank
		3/4" MNPT to Expansion Tank
Thermometer	Display Range 70 - 300 °F (20 - 150 °C)	
Pressure Gauge	Display Range 0 - 150 psi (0 - 10 bar)	
Pressure Relief Valve	Activation Pressure 87 psi (2 bar)	
Medium	Solar Circuit (Primary)	Approved Solar Heat Transfer Liquid
	Storage Circuit (Secondary)	Distilled Water

! NOTE: Run electrical cables through the outer insulation access holes in the back insulation shell before mounting unit to wall.

4. Screw the pumping station through the back insulation shell and into the mounting holes.

⚠ CAUTION: Connect the piping and ensure there are no leaks before making any electrical connections.

5. Using 3/4” MNPT fittings and either Stainless Steel Flexible/rigid or copper piping (not included), connect the Solar Pumping Station to the HXA Pumping Station (See Figures 11 & 14 for connection points).

⚠ CAUTION: Refer to tank labels and valve markings for proper fluid flow directions

! NOTE: See Solar Storage Tank and Expansion Tank Installation Instructions for additional piping and see Solar Controller Installation section for Wiring Instructions.

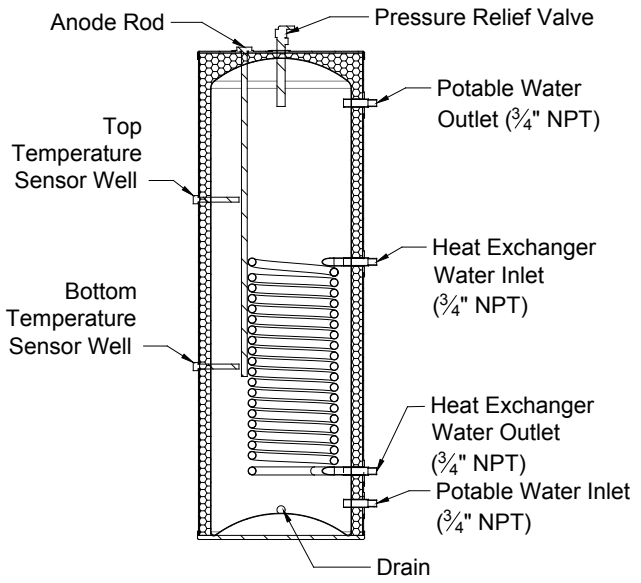
6. The HXA Pumping station requires two additional components to ensure safe and hazard free operation:
   - HXA Expansion Tank - See HXA Expansion Tank section for Installation Instructions.
   - Pressure relief collection container - It is recommended to have a container 0.26 gal (1L) in size. (Installer Supplied)

⚠ WARNING: The liquid in both of these containers can be hot and the risk of scalding will be present. When choosing the type of piping and collection container this should be taken into account.

7. Install the provided insulating cover onto the HXA Pumping Station.

! NOTE: Ensure all connecting piping is insulated to reduce heat loss.

Figure 15


Anode Rod
Pressure Relief Valve
Potable Water Outlet (¾" NPT)
Top Temperature Sensor Well
Heat Exchanger Water Inlet (¾" NPT)
Bottom Temperature Sensor Well
Heat Exchanger Water Outlet (¾" NPT)
Potable Water Inlet (¾" NPT)
Drain

HXA Expansion Tank (Only for use in Double Wall Systems)

The HXA Expansion Tank is an important safety component to the Solar Hot Water System. As the temperature of the Distilled water increases the volume does as well, the expansion tank compensates for this change.

Due to the size of the tank it can be directly mounted beside the pumping station, and requires no additional support.

! NOTE: The location, relative to the HXA Pumping station, will be dependant on the type of piping used to connect the tank to the pumping station. See Figure 14 for connection point.

! NOTE: The tank should be mounted so that the outlet is at the top for proper operation.

Solar Storage Tank

The Solar Storage Tank is heated through the circulation of the heated fluid (the type of fluid is dependent on the system that you have installed - Glycol or Distilled Water) through a heating coil located within the tank. The domestic potable water fills the tank which contains a temperature probe, located at the bottom of the tank. The temperature difference is measured between the Solar Collectors and the Solar Storage tank and compared to the set point. If there is a temperature offset between the two the Solar Controller starts the Pumping Stations.

1. Using 3/4” MNPT fittings and either Stainless Steel Flexible/rigid or copper piping (not included), connect the Solar Pumping Station or

Figure 16

HXA Pumping Station - depending on the type of system you have installed - to the Solar Storage Tank (See Figures 11 or 14, and 15)

2. Install the temperature probe into the Temperature Sensor Well, at the bottom of the Solar Storage Tank. Insert the probe into the sensor well until it gently touches the end of the well.

! **NOTE:** The temperature probe will be inserted far enough in that there will be no need to secure them into the sensor well in the same fashion as on the Solar Collector.

! **NOTE:** Plumbing instructions for connecting the Solar Hot Water System to the household water supply are included in the Commissioning section.

⚠ **CAUTION:** The installer should ensure that the Solar Hot Water System is fully setup and functioning correctly before connecting the Solar Hot Water System to the Household water supply.

Solar Controller

⚠ **WARNING:** Always completely disconnect the device from the operating voltage before performing installation or wiring work on the electrical equipment.

⚠ **WARNING:** Never mix up the connections of the protective low voltage areas (temperature sensors) with the 120V connections (pump outputs).

⚠ **CAUTION:** The Solar Controller is neither splash-proof, nor drip-proof, ensure that it is mounted in an area where it will not be exposed to excess moisture.

⚠ **CAUTION:** Ensure that the cover of the Solar Controller and the secure screw has been installed before operating the system.

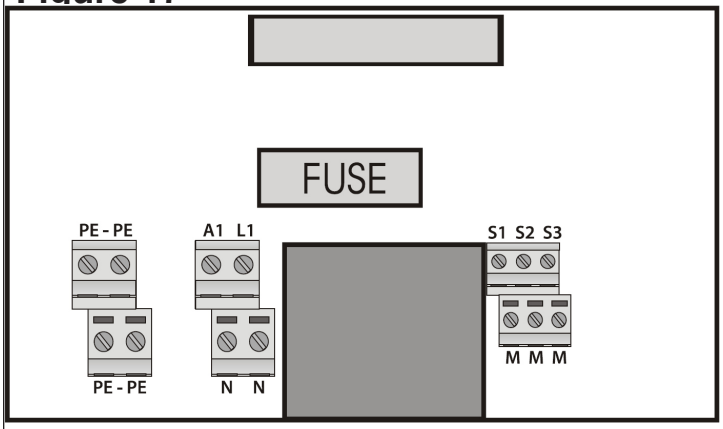
⚠ **CAUTION:** For safety reasons, the system may only remain in manual operation for testing purposes. In manual mode, the system does not monitor for maximum temperatures or sensor functions.

⚠ **WARNING:** Wiring procedures and connections should be in accordance with the National Electric code (NEC) and local codes.

Mounting the Solar Controller

1. Align and mark the mounting holes, using the drilling template (included in box with device).
2. Drill mounting holes and install wall anchors, if necessary.
3. Partially screw in the two upper screws, allowing for tightening afterwards.
4. Remove the cover attachment screw.
5. The front of the housing is locked to the back

Figure 17



PE	Ground Wire
L	Line In from Electrical Plug
N	Neutral from Electrical Plug
A1	Line Out - Pumping Station Control (both pumps)
N	Neutral Out - Pumping Station Control (both pumps)
S1	Solar Collectors Temperature Sensor
S2	Bottom Solar Storage Tank Temperature Sensor
S3	Top Solar Storage Tank Temperature Sensor (Not Included)

part using two latches. Pull the side pieces (cover plates) of the front of the housing outwards (Figure 16) to unlatch it and rotate upwards until the cover plate is opened.

6. Hang the Solar Controller onto two screws. Screw in the two lower screws.
7. Tighten all screws so the unit is secure on the wall.

! **NOTE:** Do not over tighten to avoid damage to the housing.

Wiring Instructions

All low voltage wiring is located on the right hand side of the Solar Controller and higher voltage wiring is on the left hand side of the Solar Controller. (Figure 17)

The lower voltage wiring in this system (S1 & S2) consists of two temperature sensors: one measuring the temperature of the solution leaving the Solar Collectors (S1), and one measuring the temperature of the water in the Solar Storage Tank (S2). An additional temperature probe can be installed in the top of the Solar Storage Tank (not included) for monitoring purposes.

The temperature sensors are provided with 3 ft (90 cm) of wire. Double insulated 20 ga two core sensor cable can be used to extend the cable to install the temperature probe to the solar collectors or the Solar Storage tank.

! **NOTE:** The Stainless Steel insulated corrugated piping has sensor wire built in.

! **NOTE:** Ensure that all wires to the Solar Controller are installed with appropriate strain reliefs.

! **NOTE:** The polarity of the sensor wire is not important to the installation.

The Solar Controller is supplied with a plug that is to be connected to L and N, which can then be plugged into any 120V GFI protected receptacle.

The two pumps will be wired in parallel and will be connected to A1 and N, with the wire that is provided. This will prevent any situations where one pump is running without the other.

Once the Solar Controller has been plugged into the wall receptacle, verify that the connections for the temperature sensors have been completed correctly. Using the and buttons ensure that the values are being displayed for each of the sensors S1 ( ), S2 ( ) and if a third sensor is installed S3 ( ). If the icon is present there is an issue with the corresponding sensor.

! **NOTE:** Due to the type of sensor it may take a minute or two for the temperature reading to stabilize.

⚠ WARNING: The initial start-up must be carried out by a trained, qualified person and must be recorded in writing. The technical documentation must be kept with the equipment.

⚠ CAUTION: The installer should ensure that the Solar Hot Water System is fully setup and functioning correctly before connecting the Solar Hot Water System to the Household water supply.

Before proceeding to fill the system verify that all plumbing connections have been installed and tightened, all electrical connections have been made, all of the required flashing has been installed and all piping insulated with UV resistant insulation.

There are manual valves incorporated into the Solar Loop Pumping Station as well as the HXA Pumping Station to allow for filling and draining of the system.

Shut-off ball valves

The Shut-off ball valves (Figure 11D and Figure 14D) are equipped with integrated check valves that can be set by hand. The arrow on the spindle indicates the flow direction or position (Figure 18).

⚠ CAUTION: The shut-off ball valves must only be activated by trained Operators. Failure to observe the flow direction can result in the check valve working against the intended flow direction and, as a result, blocking the flow and possibly damaging the system.

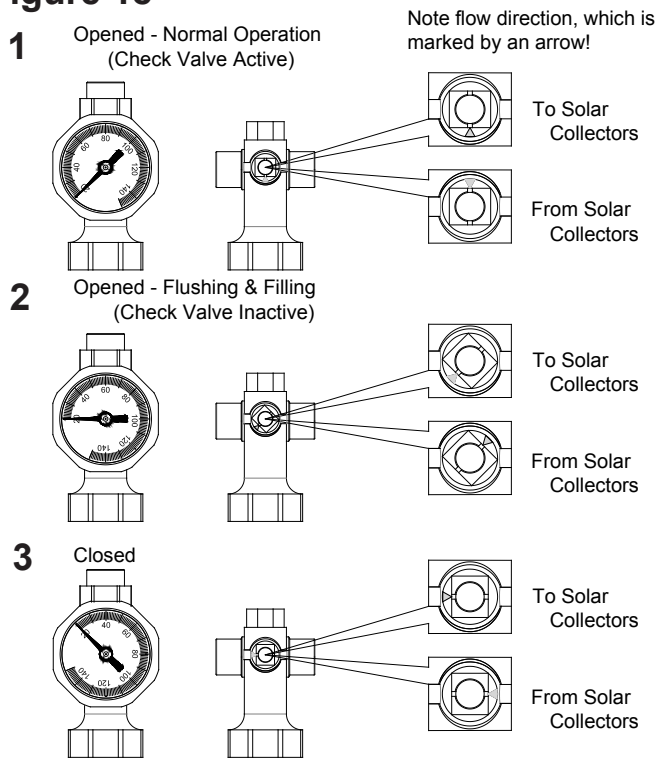
Valve settings with activated backflow preventers are (Figure 18):

- Open - Normal Operation - the arrows are vertical, depending on the direction of flow.
- Open - Flushing & Filling - the arrows are set at 45° angle, to disable the backflow preventer to allow to fill the entire system.
- Closed - the arrows are horizontal to prevent any flow through the valves - should only be used during maintenance functions.

Lower shut-off valve (Only on the Solar Pumping Station)

The lower shut-off valve is integrated in the small distributor where filling/emptying tap is located, above the flow meter (Figure 19 or Figure 11I). When the valve is set between position 1 and 2, the shut-off valve is a volume flow limiter through the solar pumping station.

Figure 18



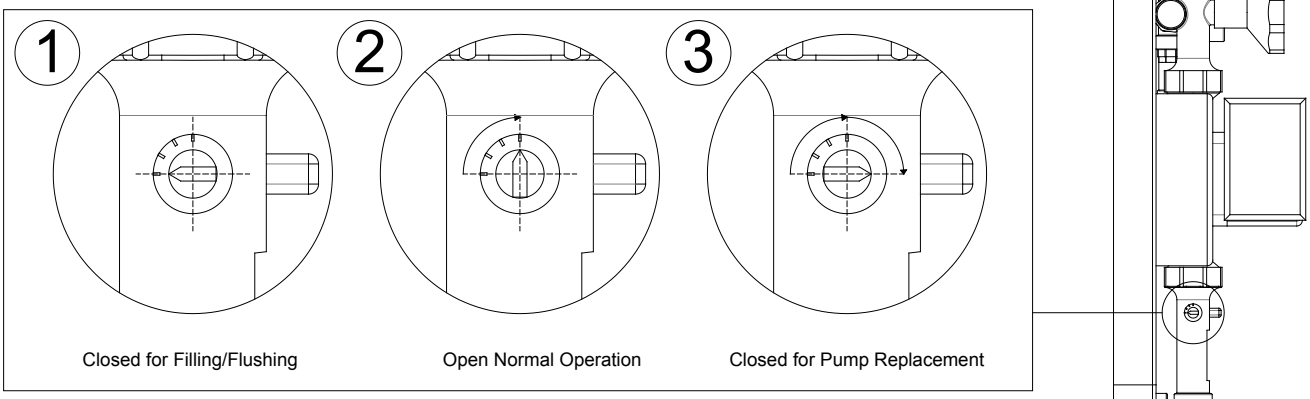
Heat Transfer Liquid System Filling - Polypropylene Glycol

⚠ WARNING: READ MSDS DATA SHEETS BEFORE HANDLING LIQUID. FOLLOW ALL PERSONAL PROTECTION AND HANDLING AND STORING REQUIREMENTS.

⚠ CAUTION: Due to the nature of the components it is suggested that the panels be covered during installation, and filling to be performed during the morning or evening hours to reduce the amount of heat transfer and subsequent hazard of scalding occurring on commissioning and start up.

1. On the Solar Pumping Station, rotate the Shut-off Ball valves (Figure 11D), to the Flushing & Filling Position (Position 2 - Figure 18).
2. Close the Isolating ball valve (Figure 11I) located above the flow meter. (Position 1 on Figure 19)

Figure 19



3. Attach the Flush and Fill Pumping system to the Flush and Fill valve connections on the pumping station (Figure 11H).
4. Open Flush and Fill valves and pump a solution of non-foaming detergent (i.e. TSP, mixed to manufacturers directions) to flush the system of any dirt or debris.
5. Flush the system with clean water to remove any remaining solution or debris.
6. It is recommended that following the flush, 50 psi (3.4 bar) pressurized air to remove any remaining water or washing solution from the system.

⚠ **CAUTION:** If substantial amounts of water are left in the system the concentration of the heat transfer fluid would be reduced and result in the risk of freezing and possible system damage.

! **NOTE:** During either the liquid cleaning or the air purging it is recommended that a pressure test be completed to ensure that there are no leaks before filling with the heat transfer solution. If leaks are present it is recommended that they are repaired and the system be retested, to ensure no additional leaks are present.

⚠ **CAUTION:** Wear all personal protective clothing required by MSDS Sheets.

⚠ **CAUTION:** Ensure that the Flush & Fill pumping station has been thoroughly cleaned to ensure no cross contamination or dilution of the heat transfer liquids.

7. Using the chosen heat transfer liquid, to ensure maximum heat absorption into the Heat Transfer system (See Installation Section for specific requirements) and the Flush & Fill Pumping station, fill the system.
8. Using the flow meter to see, ensure that there is no air in the system.

! **NOTE:** Air will collect in the air separator (Figure 11K) during filling and should be purged, by opening the purging valve to release the excess air.

9. Close the lower valve (Figure 11H) to start to pressurize the system. Once the system is filled to a pressure of 29 psi (2 bar), close the inlet valve (Figure 11H).
10. Switch off pump.
11. Install the provided insulating cover onto the Solar Pumping Station and any additional insulation on associated piping.
12. Fill out and attach the provided label, indicating the specifications of the solution, to the pumping station.

! **NOTE:** Piping insulation should be a minimum of R-4.2.

HXA Pumping Station Filling - Distilled Water (If Applicable)

⚠ **CAUTION:** Ensure that the piping and Flush and Fill Pumping station has been thoroughly

cleaned to ensure that there is no cross contamination of the heat transfer liquids

1. On the HXA Pumping Station, rotate the Shut-off Ball valves (Figure 14D), to the Flushing & Filling Position (Position 2 - Figure 18).
2. Attach the Flush and Fill Pumping system to the Flush and Fill valve connections on the pumping station (Figure 14H).
3. Open Flush and Fill valves and pump a solution of non-foaming detergent (i.e. TSP, mixed to manufacturers directions) to flush the system of any dirt or debris.
4. Flush the system with clean water to remove any remaining solution or debris.
5. It is recommended that following the flush, 50 psi (3.4 bar) pressurized air to remove any remaining washing solution in the system.

! **NOTE:** During either the liquid cleaning or the air purging it is recommended that a pressure test be completed to ensure that there are no leaks before filling with the heat transfer solution. If leaks are present it is recommended that they are repaired and the system be retested, to ensure no additional leaks are present.

6. Using Distilled Water and the Flush & Fill Pumping station, fill the system.
7. Once the system is filled, return the valves to their original state.
8. Switch off Pump.
9. Install the provided insulating cover onto the HXA Pumping station and any additional insulation on associated piping.

! **NOTE:** Piping insulation should be a minimum of R-4.2.

Potable Water Connection

⚠ **WARNING:** This system is to be installed in accordance to applicable Plumbing Codes.

When installing the Dimplex Solar Water Heater system additional plumbing will need to be added to your existing water system. (Figure 20)

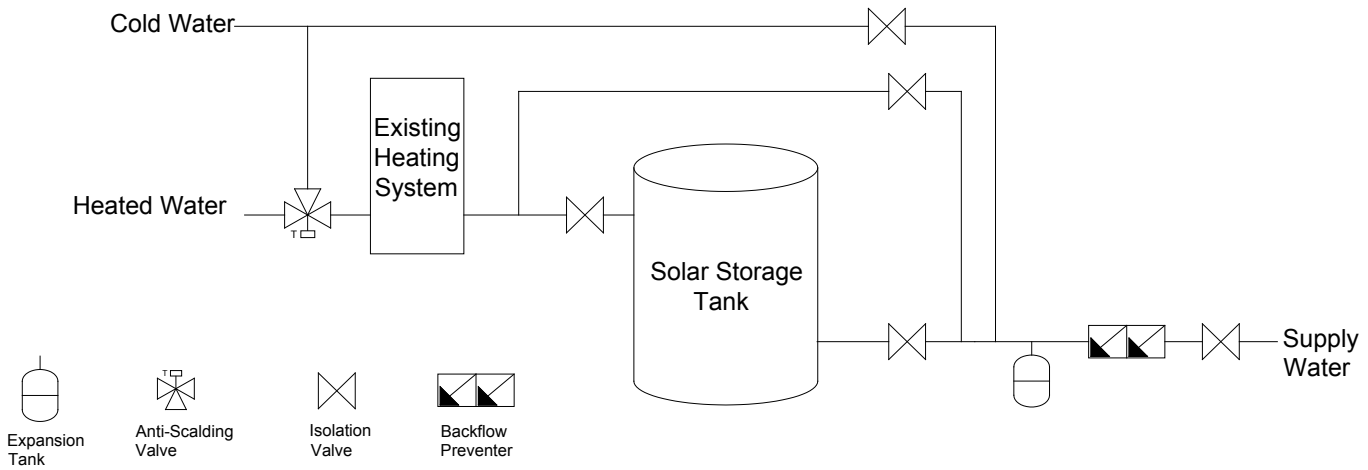
! **NOTE:** Depending on local plumbing codes the system may require the addition of a backflow preventer on the supply water inlet.

⚠ **WARNING:** If a backflow preventer is installed in the system an expansion vessel will also be required to allow for the changing volume/pressure within the closed system.

1. Pipe your potable water through an isolation valve to the inlet of the Solar Storage Tank (the bottom fitting).

! **NOTE:** It is recommended that any systems with hard water have a water softener installed in line before the Solar Hot Water System to prevent calcium build up and subsequently reduce the performance of the system.

Figure 20



Commissioning

! NOTE: The cold water supply line to the Solar Storage tank should be insulated with R-4.2, 1" (2.5cm) thick, for a minimum distance of 5' (1.5m) or to the wall if it is less than 5' (1.5m).

2. Install an isolation valve on the outlet of the Solar Storage Tank and add a Tee connection to the existing piping into the existing water heating system.
3. Install an Anti-Scalding valve on the outlet of the backup water heating systems before distribution throughout the house.

! NOTE: Anti-Scalding valves should be installed to reduce the point of use water temperature by mixing hot and cold water in branch water lines at the outlet of the heaters.

4. Close the bypass valve and open the isolation valves on either side of the Solar Hot Water System.
5. Open two faucets.
6. Open the main shut off valve and let the water run until full streams are coming out of both open water faucets. Close both faucets.
7. Actuate the pressure relief valve located on the top of the Solar Storage Tank and the Back-Up Heating System until water comes out of both, to ensure that they are full of water and free of air.

System Start Up

Once all of the piping has been filled with the associated liquid, and the system has been checked for leaks, the system can be started.

- Rotate all of the manual valves from the flushing and filling setting to the operational settings.
- Actuate the air separator to ensure that any accumulated air is removed.

! NOTE: If there is some air accumulated, open the air separator long enough to release the air. Then run the system for a little while and open it again to ensure that all of the air has been removed.

- Ensure that the Solar Controller is in automatic operation.
- Verify that covers (if used) have been removed from the solar collection panels.
- Verify that the main water supply has been turned back on.
- When the Solar Collector has been turned on and the system is running the pump icon ( ) should be On and turning in the bottom left hand corner and both of the pumps running.

After the system has been started (and the installer is satisfied that it is operating properly) complete the warranty registration, found at the end of this manual.

⚠ **WARNING: IF THE OUTDOOR TEMPERATURE IS EXPECTED TO DROP BELOW THE RATED TEMPERATURE RANGE OF THE HEAT TRANSFER LIQUID, DRAIN THE HEAT TRANSFER LIQUID OUT OF THE SYSTEM UNTIL THE THREAT IS NO LONGER PRESENT.**

Solar Collectors

There is no specific operator action required.

Piping

There is no specific operator action required.

Pumping Station - Solar Loop-A

⚠ **WARNING:** CHECK THAT ALL VALVES ARE ORIENTED IN THE APPROPRIATE DIRECTION BEFORE STARTING THESE INSTRUCTIONS. SEE FIGURES 18 & 19.

⚠ **WARNING:** This system is designed to be used with Polypropylene Glycol as a heat transfer liquid. Substitution of any other heat-transfer fluid can cause irreparable damage and create a health and safety hazard.

⚠ **WARNING:** The housing of the motor and any uninsulated piping will be hot during operation. To avoid burns, do not let bare skin touch hot surfaces.

The circulation pumps on the Solar Pumping Station and the HXA Pumping Station are controlled by the comparison of temperatures of the temperature probe in the Solar Storage Tank and the temperature probe at Solar Collectors. The Solar Controller turns the pumps On and Off and adjusts the speed, of both, to maximize the efficiency of the system and the result is a totally automated system where periodic monitoring is all that is required.

The Solar Controller will display the symbol , indicating that the pumps are On.

⚠ **CAUTION:** Both pumps should be running at the same time, if only one pump is running disconnect power to the system and troubleshoot the issue.

❗ **NOTE:** In general a lower flow rate will result in a higher heat transfer rate throughout the system, leading to higher temperatures.

- **Pressure Relief Valve**

  The pumping station is equipped with a pressure relief valve. The activation pressure of the pressure relief valve is 87 psi (6 bar).

  Although the valve is set for 87 psi (6 bar) as the pressure release, **the normal operation of the unit will be 58 psi (4 bar).**

  ⚠ **WARNING:** The supplied pressure relief valve must be permanently installed at the intended position of the solar pumping station.

- **Check Valves**

  When the system is not operating, the Check Valves in the pumping station prevent the uncontrolled circulation of the heat transfer medium. They are located in the Shut-off Ball Valves in the supply and the return lines in each pumping station.

  ⚠ **CAUTION:** The shut-off ball valves must only be activated by trained Operators. Failure to observe the flow direction can result in the check valve working against the intended flow direction and, as a result, blocking the flow and possibly damaging the system.

  They should only be opened manually (Figure 18) by adjusting the ball valves 45° clockwise, from the open operating position, for filling and draining the system or closed for maintenance to prevent any flow of solution.

- **Flow Meter**

  The pumping station is equipped with a rotameter to monitor the flow through the unit. The Solar Controller varies the speed of the pumps to maximize the heat transfer through the system. As a result the flow meter will typically **read between 0.7gpm and 1.2 gpm**.

  The flow rate of the Solar Heating Water System varies to optimize the energy gain from the solar collector into the cylinder. However, should the flow meter on the solar pumping station indicate a flow outside that range, the troubleshooting guide should be consulted as a malfunction ex-

ists.

NOTE: If there is some air accumulated, open the air separator long enough to release the air. Then run the system for a little while and open it again to ensure that all of the air has been removed.

- **Temperature Gauges**

  The system is equipped with two temperature gauges to monitor the temperature of the fluid travelling to and from the Solar Collector Panels. The color of the printing on the dial indicates the direction of flow to assist in monitoring the system:

  • Red lettering = SP (from the Solar Collectors)
  • Blue lettering = RT (to the Solar Collectors)

  The range of the gauges is 70 - 300 °F (20 - 150 °C).

Solar Loop Expansion Tank

There is no specific operator action required.

HXA Pumping Station (If Applicable)

WARNING: CHECK THAT ALL VALVES ARE ORIENTED IN THE APPROPRIATE DIRECTION BEFORE STARTING THESE INSTRUCTIONS. SEE FIGURE 19

WARNING: The housing of the motor and any uninsulated piping can be hot during operation. To avoid burns, do not let bare skin touch hot surfaces.

The circulation pumps on the Solar Pumping Station and the HXA Pumping Station are controlled by the comparison of temperatures of the temperature probe in the Solar Storage Tank and the temperature probe at Solar Collectors. The Solar Controller turns the pumps On and Off and adjusts the speed, of both, to maximize the efficiency of the system and the result is a totally automated system where periodic monitoring is all that is required.

The Solar Controller will display the symbol , indicating that the pumps are On.

CAUTION: Both pumps should be running at the same time, if only one pump is running disconnect power to the system and troubleshoot the issue.

- **Pressure Relief Valve**

  The pumping station is equipped with a pressure relief valve. The activation pressure of the pressure relief valve is 29 psi (2 bar).

  Although the valve is set for 29 psi (2 bar) as the pressure release, **the normal operation of the unit will be 14.5 psi (1 bar).**

  WARNING: The supplied pressure relief valve must be permanently installed at the intended position of the solar pumping station.

- **Check Valves**

  When the system is not operating, the Check Valves in the pumping station prevent the uncontrolled circulation of the heat transfer medium. They are located in the Shut-off Ball Valves in the supply and the return lines in each pumping station.

  CAUTION: The shut-off ball valves must only be activated by trained Operators. Failure to observe the flow direction can result in the check valve working against the intended flow direction and, as a result, blocking the flow and possibly damaging the system.

  They should only be opened manually (Figure 18) by adjusting the ball valves 45° clockwise, from the open operating position, for filling and draining the system or closed for maintenance to prevent any flow of solution.

- **Temperature Gauges**

  The system is equipped with two temperature gauges to monitor the temperature of the water travelling to and from the Solar Collector Panels. The color of the text on the dial indicates the direction of flow to assist in monitoring the system:

  • Red lettering = SP (from the Solar Pumping Station)
  • Blue lettering = RT (to the Solar Pumping Station)

  The range of the gauges is 70 - 300 °F (20 - 150 °C).

HXA Expansion Tank

There is no specific operator action required.

Solar Storage Tank

The Solar Storage Tank is equipped with a pressure relief valve. The activation pressure of the pressure relief valve is 29 psi (2 bar).

Although the valve is set for 29 psi (2 bar) as the pressure release, **the normal operation of the unit will be 14.5 psi (1 bar).**

⚠ **WARNING:** The supplied pressure relief valve must be permanently installed at the intended position of the Solar Storage Tank (Figure 15).

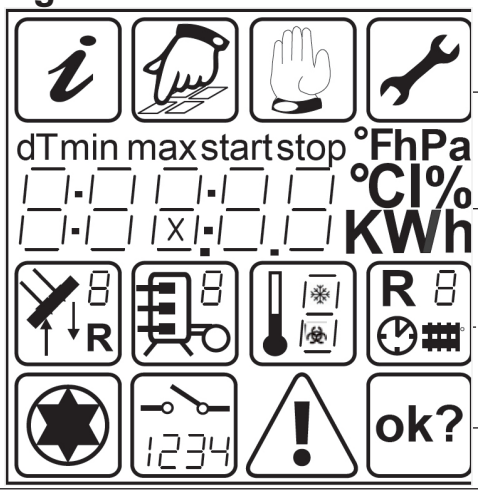
Solar Controller

⚠ **CAUTION:** Ensure that the cover of the Solar Controller and the secure screw has been installed before operating the Solar Controller.

Figure 21

Button	Function	Description
	"Up" "+"	• Value change: increase of the indicated value by 1, holding the button causes the value to increase continuously
	"Access" "Down" "-"	• Access a main menu, decrease menu items • Value change: decrease of the indicated value by 1, holding the button causes the value to increase faster
	"Scroll left" "Exit" "Cancel"	• In main menu scroll to the left • Exit a menu • Exit a menu item • Cancel value change without saving the value
	"Scroll right" "Select" "Confirm"	• In main menu scroll to the right • Select a menu item • Confirmation of value change and saving the value

Figure 22



Once the Dimplex Solar Hot Water System is installed and commissioned the system will be set to automatically operate. No user intervention is required to ensure the most efficient and safe operation of the system.

However, the user might want to check from time to time the temperatures, pressures and flows to verify that no issues have arisen.

Operation of the Solar Controller SOLAREG II takes place by means of 4 operating buttons. (Figure 21) With these operating buttons you can: toggle through settings and operational values, and change device settings.

The symbols on the display lead you in a simple sequence through the operating structure and show clearly the current menu points, display values or parameters. To make the operation of the appliance clear, the appliance operating and display functions are divided into 4 main menus: Information, Programming, Manual Operation and Basic Adjustment. Each active menu is presented in the upper line of the display through corresponding graphic symbol.

Pressing the button will allow the user to toggle through the main menus.

! **NOTE:** Not all displayed icons are available with this version of the controller.

☛ Operation

Information Menu

The Information Menu is the main menu for automatic regulation of Solar Hot Water System. It indicates current system values, the current system condition, any error messages and the number of operating hours. The table below indicates the readings in the Information Menu and whether they can be reset to assist in monitoring the system.

Using the and buttons will allow the user to toggle through the displayed values.

	Description	Indication E.g.	Reset Possible
	Indication of current Solar Collector temperature (S1)	150 °F	No
	Indication of minimum Solar Collector temperature (S1)- since startup or the last reset. Resets to current temperature	min. 50 °F	Yes
	Indication of maximum Solar Collector temperature (S1) - since startup or the last reset. Resets to current temperature	max. 170 °F	Yes
	Indication of current temperature of the Solar Storage Tank (S2)	122 °F	No
	Indication of minimum temperature of the Solar Storage Tank (S2)- since startup or the last reset. Resets to current temperature	min. 104 °F	Yes
	Indication of maximum temperature of the Solar Storage Tank (S2)- since startup or the last reset. Reset to current temperature	max. 150 °F	Yes
	Indication of the current temperature of the Optional Temperature Sensor (S3)	130 °F	No
	Operating hours for charging the Solar Storage Tank - since startup or the last reset. Resets to 0 h	1234 h	Yes

If the values are marked as “reset-able“, they may be reset in the following way:

- Toggle through to the value to be reset. Press both buttons and
- Resetting of the value by pressing the button
- “OK?” will appear, confirm with = no or = yes

Programming Menu

All adjustable parameters can be checked in this menu and, if necessary, changed. The unit is set up with factory default values, which as a rule guarantee a problem-free operation of the system. The table below indicates the parameters which are adjustable in your system.

! NOTE: Any changes can affect how the system functions and should only be changed by a technician.

☛ Operation

	Description	Indication e.g.	Value range	Default Settings
	Solar Storage tank: Maximum Permissible temperature	max. 149°F	59-185°F (15-85°C)	149°F (65°C)
	Solar Storage tank: switch-on difference	dT max 13°F	5-72 °F (3-40°C)	13 °F (7°C)
	Solar Storage tank: switch-off difference	dT min. 5°F	4-30 °F (2-17°C)	5 °F (3°C)
1 2	Set the minimum pump capacity using the RPM control 100% = RPM control off	min. 100	30%-100%	100%

To change the values:

- Toggle through to the setting to be changed. Press the button and the value will begin to flash.
- Using the and buttons adjust the setting to the desired value.
- Press the button and “OK?” will appear, confirm with = No or = Yes.

Manual Operation Menu

⚠ **CAUTION:** Settings and changes in this menu must only be carried out by a specialized technician. Incorrect settings can damage or adversely affect the function of the Solar Hot Water System.

For service and test purposes the Solar Hot Water System can be operated manually. For this purpose 120V switch outputs may be disconnected or connected. During manual operation there is no automatic regulation of the system. To avoid unregulated operating states this mode of operation changes into “Indication“ after 8 hours and the automatic regulation is activated again.

Indication	Description	Value Range
1	Switching on / off switch output A1 (solar circulation pump) by hand	0 = off 1 = on

To change the values:

- Toggle through to the setting to be changed. Press the button and the value will begin to flash.
- Using the and buttons adjust the setting to the desired value.
- Press the button and “OK?” will appear, confirm with = No or = Yes.

Protective Functions Menu

⚠ **WARNING:** Adjustments and changes in this menu must be carried out only by an installer or specialized technician. Incorrect adjustments may affect the function of the Solar Controller and Solar Hot Water System.

There are two basic Protective Functions that the system is equipped with: Solar Collector Protection and Recooling (Holiday Function).

- The **Solar Collection Protection** function should be enabled all of the time to protect the system from overheating and possibly causing damage to the system. If the Solar Storage Tank reaches the

set maximum temperature and the Solar Collector temperature exceeds the Solar Collector Protection setting (Line 1) the pumping stations will be switched on and will continue to run until the Solar Collector Temperature is 18°F (8°C) below the set maximum tank temperature. In this case, the Solar Storage Tank is charged up to 250°F (121°C) regardless of the set maximum temperature.

- The **Recooling (Holiday) Function** is a function that should be enabled when the system is not going to be used for an extended period of time, i.e. going on Vacation. The Recooling Function is only effective if the Solar Storage Tank temperature is below the temperature limit (203°F). Therefore, during the holiday period, for example, the Solar Storage Tank is discharged at night to the set recooling temperature.

⚠ **CAUTION:** Make sure not to activate the Recooling (Holiday) function together with the backup heating. As an additional cost saving measure the backup system set point can be reduced, as well.

! **NOTE:** The Recooling function has been setup to only be functional when the Solar Collector Protection is enabled. If the Solar Collector Protection is disabled when the Recooling Function is enabled, the Solar Controller will turn off both.

To avoid accidental changes in menu “Basic adjustment”, it is not adjustable in normal functioning but has only display function. To be able to carry out any changes, you must choose this menu within the first minute after switching on the appliance or by simultaneously pressing the buttons then **The basic adjustment menu “is blocked“ automatically within one minute after leaving or one minute after switching on the appliance.**

Indication Line / value	Description	Value range	Factory set-up
0 -- 0	Solar Collector Protection On or Off Function	0 = Off / 1 = On	**0 = Off***
1 -- 250 °F	Temperature at which the Solar Collector protection function is active	230-302°F (110-150°C)	**250 °F** (121 °C)****
2 -- 0	Recooling Function On or Off (Will only function when the Solar Collector Protection is On)	0 = Off / 1 = On	0 = Off
3 -- 104 °F	Temperature to which the Solar Storage Tank is re cooled after active Solar Collector protection function	86-176°F (30-85°C)	104 °F (40 °C)

*** This setting should be changed so that during normal operation it is On.**

**** This setting should be changed so that it is set to Maximum 302°F (150°C)**

To change the values:

- Pressing the buttons then press , this will allow for unlimited editing.
- Toggle through to the setting to be changed. Press the button and the value will begin to flash.
- Using the and buttons adjust the setting to the desired value.
- Press the button and “OK?” will appear, confirm with = No or = Yes.

Maintenance

⚠ **WARNING:** Always completely disconnect the device from the power supply before performing maintenance or electrical work.

The Solar Hot Water System should be monitored on at least a monthly basis, by checking system pressures, flows and temperatures to ensure that they are within normal operating range. These ranges can be found in the Operation Section of the manual and the Warranty Sheet.

The entire system, both the Solar Heating system and the Back-up heating system, should be inspected on a yearly basis, Fall is suggested, to ensure proper operation and condition of each component.

⚠ **WARNING:** The components and liquid in the system can be hot and the risk of burning/scalding will be present.

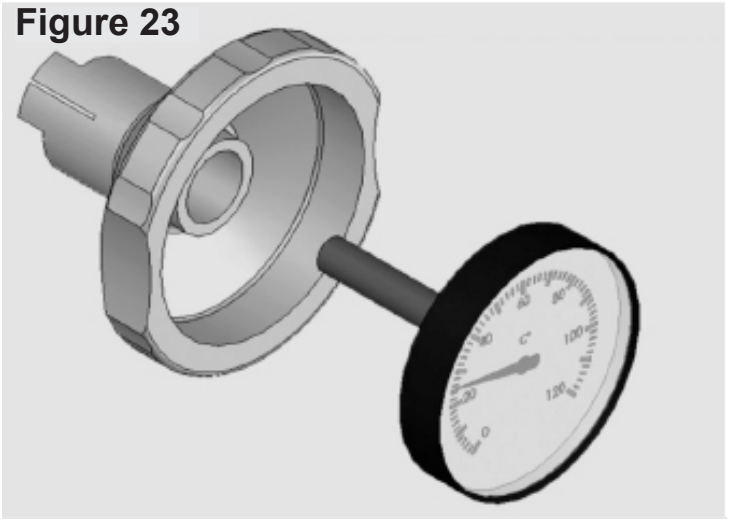
Solar Collectors

When maintaining the Solar Collectors, the following should be inspected:

- Visually check for shading of the collectors during the day (mid-morning, noon, and mid-afternoon) on an annual basis. Shading can greatly affect the performance of solar collectors. Vegetation growth over time or new construction on your house or your neighbor's property may produce shading that wasn't there when the collectors were installed.
- Ensure that there is no build up of dirt on the panels and clean if necessary, using a soft cloth and warm soapy water.
- Look for cracks in the collector glazing, and check to see if seals are in good condition. Plastic glazing, if excessively yellowed, may need to be replaced.
- Ensure that the sensor is fully inserted.
- Take note of the condition of the sensor wire. Ensure that there is no damage to the protective coating and that all connections are still intact.

! **NOTE:** When replacing parts of the insulation ensure the sensor cable is protected from getting damaged when cutting the insulation.

Figure 23



- Roof penetrations - Flashing and sealant around roof penetrations should be in good condition.
- Support structures - Check all nuts and bolts attaching the collectors to any support structures for tightness.

Piping

There is no specific maintenance that is required for the piping. A visible inspection is all that is required. Ensure that there are no signs of leaking or large areas of rusting that could begin to leak, check that all of the insulation is present and access to the Solar Controller, pressure relief valves, and the connecting cables is ensured.

Pumping Stations - Solar Loop and HXA

Inspect all piping connections for tightness and leaks, ensure that insulation is not showing any signs of degradation or damage, and repair/replace as necessary.

On the Solar Pumping Station inspect the condition of the Polypropylene Glycol through the flow meter. The Polypropylene Glycol should be a clear yellow color, if it appears to be slightly cloudy or black it will need to be replaced. The pH of the solution should be taken on a yearly basis to help determine the condition beyond color change.

! **NOTE:** Consult Safety Data Sheets/MSDS Data

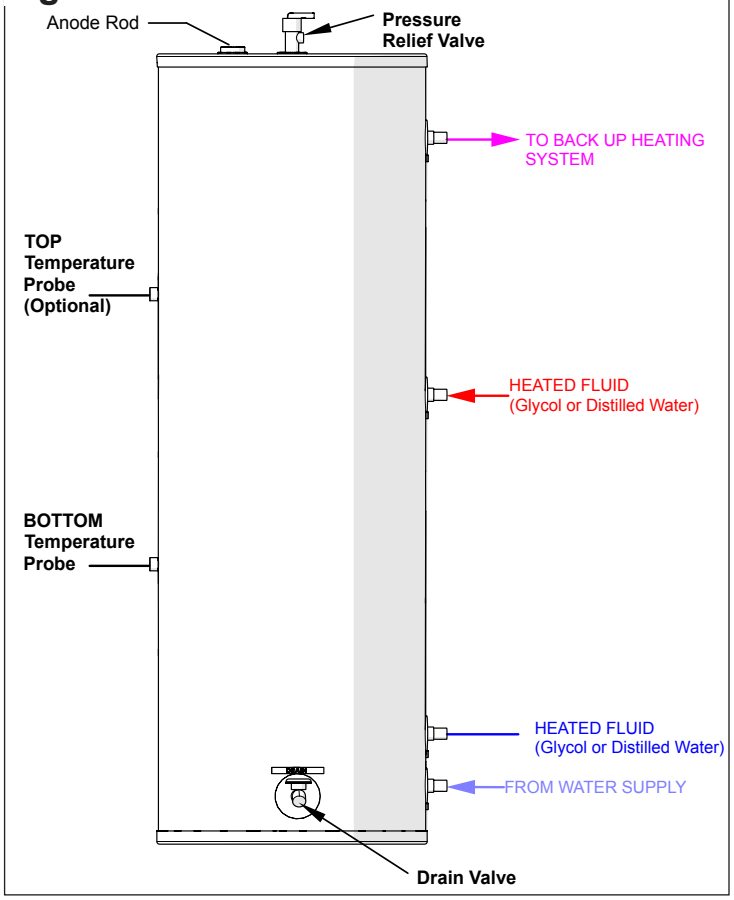
Sheets for pH range of solution. If the pH is outside of the range the solution should be replaced.

! NOTE: It is suggested that you change the distilled water at the same time that you change the Polypropylene Glycol, if equipped with a HXA Pumping Station. See Decommissioning Section for Polypropylene Glycol removal from system.

! NOTE: If there are any air bubbles in the flow meter it can be an indication of a leak in the Solar Loop Pumping Station or the air separator is functioning incorrectly. If there is some air accumulated, open the air separator long enough to release the air. Then run the system for a little while and open it again to ensure that all of the air has been removed.

Check the Pressure Relief Collection Containers on both pumping stations. In normal operation these containers should not have any liquid present but if there is contact your local Service Technician to check the Pressure Relief Valves and the overall operation of the system.

Figure 24



The thermometers should be checked to ensure that they are reading correctly, they can be easily replaced, if required. The thermometers are inserted into the body of the ball valve below and can be removed by simply pulling the dial out of the valve handle. (Figure 23) It should be ensured that when a thermometer is removed, it is replaced by an identical thermometer. Please observe the color label:
Red lettering = SP (from the Solar Collectors);
Blue lettering = RT (to the Solar Collectors)

Expansion Tanks

On a yearly basis perform a visible inspection of both the Solar Loop and HXA expansion tanks for any exterior signs of wear or damage.

To inspect the diaphragm briefly actuate the nitrogen valve, located on the bottom of the tank. If nitrogen is released the tank is still in working order. If some of the liquid is released the diaphragm has a leak or has failed. The tank will need to be replaced.

If either of the expansion tanks need to be replaced, reduce the temperature and pressure in the system, isolate the tank, drain the fluid and replace. (The same procedure can be used to disassemble the system.)

Storage Tanks

A visible inspection of the Storage Tanks, insulation, the insertion of the temperature probe(s) and the tightness of the fittings should be done on a yearly basis.

On a bi-annual basis the anodes within the tank will need to be replaced to ensure the maximum life and efficiency of the Solar Storage Tank. The system has been equipped with 2 replacement anodes.

Changing Anode Rod

1. Turn off the power or fuel to your Back-up Water Heating System.
2. Turn off power to the Solar Water Heater System.
3. Allow the water in both tanks to cool.

⚠ **WARNING:** The water in both of the tanks is hot enough that it could scald.

4. Close the Household Water isolation valve.
5. Turn on a hot water faucet to relieve pressure from the system.
6. Turn on another faucet, to allow air into the system.
7. Open the drain valve at the bottom of the Solar Storage Tank and drain approximately 2 gallons (7.5 liters) of water from the tank, so that when the rods are removed water does not splash out of the hole.
8. Unthread the Anode rod from top of tank. The rod may be rusted in place, the use of spray lubricant will assist in removing the rod.
9. Add sealant, pipe compound or Teflon tape, to the threads on the new anode, so that the threads are sealed from leaking. Ensure that there is allowance made for contact between the tank metal and the anode rod.

! **NOTE:** Test the installation with a volt meter, by ensuring that there is electrical continuity between the anode head and the pipe nipple.

10. Open the main shut off valve and let the water run until full streams are coming out of both open water faucets. Close both faucets.
11. Actuate the pressure relief valve located on the top of the Solar Storage Tank until water comes out, and all of the air has been removed.
12. Restore power and fuel to both of the water heating systems.

Solar Controller

⚠ **CAUTION:** Do not operate if there is any recognisable damage to the Solar Controller, cables or the connected pumps and valves.

There is no specific maintenance that is required for the Solar Controller. A visible inspection is all that is required. Ensure that the cover has not been damaged, the wires going in and out of the Solar Controller have no signs of wear or damage and that all of the wires/connections within the Solar Controller are still secure.

Decommissioning

WARNING: Always completely disconnect the device from the power supply before performing maintenance or electrical work.

WARNING: The decommissioning must be carried out by a trained, qualified person and must be recorded in writing. The technical documentation must be kept with the equipment.

The following instructions can be used for replacing Fluids, fixing failed components or disassembling the system. Depending on the task that is required all or only some of the following steps will be required.

WARNING: READ MSDS DATA SHEETS BEFORE HANDLING LIQUID. FOLLOW ALL PERSONAL PROTECTION AND HANDLING, STORING AND DISPOSING REQUIREMENTS.

1. Turn off Solar Controller and unplug.
2. Isolate the Solar Hot Water System, see Figure 20.

NOTE: By isolating the Solar Hot Water System the Back-Up system can continue to run to ensure continuous Hot Water Supply.

3. Cover Solar Collectors and allow the system to cool - fluids, piping and components, to minimize heat transfer during Decommissioning.

CAUTION: Due to the nature of the components the system, they should be allowed to cool and that draining should be performed during the morning or evening hours to reduce the amount of heat transfer and subsequent hazard of scalding.

4. On the Solar Pumping Station, rotate the Shut-off Ball valves (Figure 11D) to the Flushing & Filling Position (Position 2 - Figure 18).
5. Close the Isolating ball valve (Figure 11I) located above the flow meter. (Position 1 on Figure 19)
6. Attach the Flush and Fill Pumping system to the Flush and Fill valve connections on the pumping station (Figure 11H).

CAUTION: Ensure that the connections are secure before opening the valves, since the system is pressurized.

7. Open Flush and Fill valves and allow the solution to drain out of the system.

NOTE: A secondary manual valve is necessary to allow air into the system to assist in draining.

8. Close the Flush and Fill Valves.

CAUTION: Follow National and Local Environmental Regulations for the disposal of the Heat Transfer Solution.

NOTE: If the solution is being replaced, the commissioning instructions can be followed to refill the system.

CAUTION: Ensure that the piping and Flush and Fill Pumping station has been thoroughly cleaned to ensure that there is no cross contamination of the heat transfer liquids (old and new) that may shorten the life of the new solutions.

NOTE: Maintenance on Solar Loop Pumping Station, Solar Collectors or associated piping can now be performed.

9. On the HXA Pumping Station, rotate the Shut-off Ball valves (Figure 14D), to the Flushing & Filling Position (Position 2 - Figure 18).
10. Attach the Flush and Fill Pumping system to the Flush and Fill valve connections on the pumping station (Figure 14H).
11. Open Flush and Fill valves and pump the Heat Transfer solution out of the system.
12. When most of the solution has been removed turn off the pump, and allow the remainder of the solution to drain out of the system.
13. Close the Flush and Fill Valves.

NOTE: If the solution is being replaced, the commissioning instructions can be followed to refill the system.

CAUTION: Ensure that the piping and Flush and Fill Pumping station has been thoroughly cleaned to ensure that there is no cross contamination of the heat transfer liquids (old and new) that may shorten the life of the new solutions.

NOTE: When both fluids have been removed maintenance on both Pumping Stations, Solar

🛠 Decommissioning

Loop and HXA, or associated piping can be performed.

14. To empty the Solar Storage Tank, open the pressure relief valve on the top of the unit.
15. Open the drain valve at the bottom of the Solar Storage Tank and empty tank.
16. All of the sections of the Solar Hot Water System can now be disassembled.

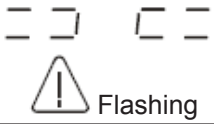
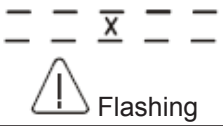
⚠ **CAUTION:** Ensure that any penetrations into the roof or exterior of the building are filled and sealed following removal of the system to prevent any water penetration or environmental damage to the structure.

Troubleshooting

Problem	Possible Cause	Corrective Action
The Solar Controller does not turn On	1. Unit is not plugged in. 2. Circuit breaker has tripped.	1. Plug unit in to outlet. 2. Check electrical panel.
The Pump(s) do not turn On (but controller has power)	1. System does not need pumps On 2. Loose wiring	1. Pumps should only be running if symbol is turning. 2. Unplug unit and check pump connections inside of Solar Controller
Backup heat System running when Solar system should be running	1. Temperature probes not correctly installed. 2. Temperature probes not reading correctly	1. Check the installation of probes, ensure that they are fully inserted into Solar Collector and Solar Storage tank. 2. Check the wiring to the Solar Controller, ensure that wires are secure in Solar Controller input. 3. Temporarily switch connection points in Solar Controller to determine if Temperature Probes and Solar Controller are functioning properly, replace defective probe(s) if necessary.
Color of Polypropylene glycol has changed from yellow to milky or black	1. pH of Polypropylene has decreased due to glycol inhibitor degradation	1. Flush system of Polypropylene Glycol and replace with new solution. See Decommissioning and Commissioning sections for instructions.
Large Volume of Glycol in Pressure Relief collection Tank	1. Diaphragm in Solar Loop Expansion Tank no is longer working 2. Failure of pressure relief valve	1. Briefly actuate the nitrogen valve, located on the top of the tank, if nitrogen is released the diaphragm is still in working order, if water comes out the expansion tank will need to be replaced. 2. Contact installer to inspect the system.
Operating Pressure is dropping over time	1. Leak in System (Solar Loop Operating pressure 4 bar, Resting pressure 2 bar) 2. Large volume of liquid in Pressure Relief Collection Containers	1. Check for leaks and repair as necessary. If operating pressure is still low, will need to add more liquid to system (Polypropylene glycol or Distilled water) 2. Check flow meter for air in viewer - release excess air. 3. Problems with system/pressure relief valves, contact installer to check system operating settings.
Insufficient/Excessive Pressure	1. Leak in system. 2. Manual valves not in appropriate setting.	1. Check plumbing connections and repair if necessary 2. Adjust valves to proper settings 3. Contact Installer to inspect the system.

Troubleshooting

Solar Controller Errors

Error representation on display	Possible Cause	Corrective Measures
 Flashing	• Sensor wire broken • Defective sensor	• Check wire • Check sensor resistance, if necessary replace sensor
 Flashing	• Short circuit in sensor wire • Defective sensor	• Check wire • Check sensor resistance, if necessary replace sensor
Error representation	**Possible Cause**	**Corrective Measures**
No display function	• Lost main power • Controller internal safety fuse failed • Appliance defect	• Check to ensure that circuit breaker has not tripped • Check other 120V components on circuit to see if they are working • Check safety fuse in controller, replace it by a new one, type 2A/T, if necessary • Consult installer
Solar Controller does not work	• Solar Controller is in manual operation • No demand for unit to be on	• Exit menu “Manual Operation” • Wait until temperatures place demand on system to turn on
Symbol “Pump” rotates, but pump does not work	• Loose wiring	• Check pump(s) wiring connections • Consult Installers
Temperature display varies strong in short time intervals	• Interference from neighboring wires • Long sensor wires lengthened without shielding • Controller or Sensor defect	• Adjust location of wires • Shield Sensor Wires • Consult Installers

Warranty

DIMPLEX NORTH AMERICA LIMITED - LIMITED WARRANTY FOR SOLAR PRODUCTS

Scope of limited warranty coverage

Dimplex North America Limited's ("**Dimplex**") limited warranty to the original purchaser ("**you**") of a product from the Dimplex product range set out below (each a "**Product**") is as follows (the "**Warranty**"): Subject to the terms and conditions set out below, Dimplex warrants that new Products shall be free from defects in workmanship and materials under normal and proper usage, maintenance and service for the warranty periods set out below (each, a "**Warranty Period**").Upon expiration of the applicable Warranty Period, all liability of Dimplex in respect of the Warranties shall terminate.

Dimplex will extend the coverage of the Warranty and the duration of the Warranty as set out below provided that the you register for such extended warranty within 60 days from the date of installation of a Product by a Dimplex authorized dealer ("**Dealer**"). Registration for extended Warranty coverage may be made at: www.renewables.dimplex.com/solar_hot_water/warranty_registration.

Product	Catalogue Number	Warranty Period and Coverage	Extended Warranty Period and Coverage
Solar Hot Water System, Indirect Single Wall HX ES-SW-A, 2 Collector	ESSW2	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	Warranty Period: 10 years on collectors 6 years on the tank 2 years on the controls Coverage: parts
Solar Hot Water System, Indirect Double Wall HX ES-DW-A, 2 Collector	ESDW2	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	Warranty Period: 10 years on collectors 6 years on the tank 2 years on the controls Coverage: parts
Solar Collector, FP-Blue-A, 2M	DSCA-2M	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	Warranty Period: 10 years. Coverage: parts
Storage Tank, Solar HX, 53GAL/200L	DSTA-200	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	Warranty Period: 6 years. Coverage: parts
Expansion Tank, Solar Loop, 6.6GAL/25L	9702900	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	N/A
Controller, Solar-A	45111.5 NA	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	Warranty Period: 2 years. Coverage: parts
Pumping Station, Solar Loop-A	45722.1 NA	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	N/A
Pumping Station, HX-A	45411.30 NA	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	N/A
Expansion Tank, HX-A, 0.5GAL/2L	5400250100	Warranty Period: 1 year. Coverage: parts and freight to Dealer.	N/A

The Warranty Period begins on the date of purchase as shown on your invoice or purchase receipt (as applicable).

Upon determination by Dimplex that a Product has manufacturing defects under proper use, maintenance and service, the sole remedy available to you is for Dimplex, at its option, to either: (i) replace the applicable Product; (ii) replace non-performing components of the applicable Product; or (iii) make all necessary repairs or modifications to the applicable Product.

The Warranty applies to the original purchaser of a Product and is transferrable only to subsequent residents of the same address as such original purchaser. The Warranty may be subject to further limitations for purchases of Products made outside of the United States or Canada. Please consult your Dealer for further information regarding any such limitations.

What is not covered by this limited warranty?

The Warranty is void, does not apply under, and does not cover defects or damages to a Product resulting from any: (i) use with the applicable Product of components and/or parts that are not warranted by Dimplex; (ii) misuse, abuse, accident, negligence or alteration; (iii) improper installation of the applicable Product including, but not limited to, over-tightening of fittings, installation methods that are not in compliance with the applicable codes, regulations or ordinances of any applicable governmental authority, or installation that is otherwise not in accordance with Dimplex's installation and operating instructions; (iv) use of a Product for a purpose other than medium temperature (110 - 160°F / 43 - 70°C) domestic or residential water heating; (v) improper maintenance, storage, handling or operation of the applicable

Warranty

Product; (vi) clouding or condensation; (vii) chemicals, fluids or liquids that are not authorized or otherwise approved by Dimplex for with the applicable Product; (viii) freezing temperatures and other natural or extreme weather conditions; and/or (ix) fire or other factors or circumstances that are outside of Dimplex's control including, but not limited to, an Act of God.

The Warranty does not apply to and does not cover: (i) cosmetic damage including, without limitation, discoloration or glazing; or (ii) any breakage to any glass component of a Product. Further, the Warranty does not apply to and does not cover Products for which you do not have proper commissioning and maintenance records.

How to Make a Warranty Claim?

If you discover a defect in materials within the Warranty Period, you must promptly contact the Dealer to begin the Warranty claim process. Making a Warranty claim will require the following:

- a completed Dimplex warranty claim form (which will be provided to you by the Dealer as part of the claim process);
- proof of purchase of the Product from a Dealer;
- digital pictures of the alleged defective in the Product(s);
- applicable commissioning and maintenance records; and
- such other supporting documentation and materials as Dimplex may require.

Additional conditions of this limited warranty?

You must submit all necessary information requested by Dimplex through the Dealer for Dimplex to assess your warranty claim. The Warranty will extend only to claims received by Dimplex before the end of the applicable Warranty Period. Product removal, reinstallation, and related costs and fees are excluded from the Warranty. All replaced Products will become Dimplex's property and the replacement Product(s) becomes your property.

What Dimplex will do in the event of a valid warranty claim?

Upon determination by Dimplex that a Warranty claim is valid, Dimplex shall either deliver repaired or replaced Product(s) or components to the Dealer, freight pre-paid by Dimplex or provide the end user a monetary value for the length of the product warranty in the amount of: $440 per collector, $725 for the tank and $350 for the controller.

All other costs of removal and/or re-installation of the Product(s) or components associated with Dimplex's Warranty services including, but not limited to, any additional labour, shipping duty or other charges, shall be borne by you.

Limitations of this limited warranty and what Dimplex is not responsible for

THE WARRANTY IS YOUR EXCLUSIVE WARRANTY AND CONSTITUTES THE SOLE LIABILITY OF DIMPLEX TO YOU FOR ALL PRODUCTS. DIMPLEX HEREBY DISCLAIMS ALL OTHER REPRESENTATIONS, WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF EXPRESS OR IMPLIED WARRANTIES, SO THE FOREGOING EXCLUSIONS MAY NOT APPLY TO YOU. IN THAT EVENT, ALL EXPRESS AND IMPLIED WARRANTIES ARE THEN LIMITED TO THE WARRANTY PERIOD SET OUT ABOVE.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, IN NO EVENT WILL DIMPLEX, OR ITS DIRECTORS, OFFICERS, OR AGENTS, BE LIABLE TO YOU OR ANY THIRD PARTY, WHETHER IN CONTRACT, IN TORT, OR ON ANY OTHER BASIS, FOR ANY INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY, CONSEQUENTIAL, OR INCIDENTAL LOSS, COST, OR DAMAGE ARISING OUT OF OR IN CONNECTION WITH THE SALE, MAINTENANCE, USE, OR INABILITY TO USE THE PRODUCT, EVEN IF DIMPLEX OR ITS DIRECTORS, OFFICERS, OR AGENTS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSSES, COSTS OR DAMAGES, OR IF SUCH LOSSES, COSTS, OR DAMAGES ARE FORESEEABLE. IN NO EVENT WILL DIMPLEX, OR ITS OFFICERS, DIRECTORS, OR AGENTS BE LIABLE FOR ANY DIRECT LOSSES, COSTS, OR DAMAGES THAT EXCEED THE PURCHASE PRICE OF THE PRODUCT. AS SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, THE ABOVE LIMITATIONS OR EXCLUSION MAY NOT APPLY TO YOU.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

Miscellaneous

The division of this document into sections and the insertion of headings are for convenience of reference only and do not affect the construction or interpretation of this document. Each section of this document is distinct and severable. If any section of this document, in whole or in part, is or becomes illegal, invalid, void, voidable or unenforceable in any jurisdiction by any court of competent jurisdiction, the illegality, invalidity or unenforceability of that section, in whole or in part, will not affect: (i) the legality, validity or enforceability of the remaining sections of this document, in whole or in part; or (ii) the legality, validity or enforceability of that section, in whole or in part, in any other jurisdiction. The failure of Dimplex to exercise or enforce any right or provision of this document shall not operate as a waiver of such right or provision. This document is governed by, and is to be construed and interpreted in accordance with, the laws of the Province of Ontario and the laws of Canada applicable in that Province. The United Nations Convention on Contracts for the International Sale of Goods (also called the Vienna Convention, and which is cited in the statutes of Canada as the International Sale of Goods Contracts Convention Act) will not apply to this Agreement or the transactions contemplated by this Agreement.

Dimplex North America Limited
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Cambridge ON
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Material Safety Data Sheet
The Dow Chemical Company

Product Name: DOWFROST* HD Heat Transfer Fluid, Dyed

Issue Date: 08/12/2010
Print Date: 24 Nov 2010

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
DOWFROST* HD Heat Transfer Fluid, Dyed

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Yellow to green
Physical State: Liquid.
Odor: Characteristic
Hazards of product:

No significant immediate hazards for emergency response are known.

OSHA Hazard Communication Standard
This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects
Eye Contact: May cause slight temporary eye irritation. Corneal injury is unlikely.
Skin Contact: Prolonged contact is essentially nonirritating to skin. Repeated contact may cause flaking and softening of skin.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Mist may cause irritation of upper respiratory tract (nose and throat).

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Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.
Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.
Effects of Repeated Exposure: In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

3. Composition Information

Component	CAS #	Amount
Propylene glycol	57-55-6	> 93.0 %
Water	7732-18-5	< 5.0 %
Dipotassium hydrogen phosphate	7758-11-4	< 5.0 %

4. First-aid measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.
Skin Contact: Wash skin with plenty of water.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Ingestion: No emergency medical treatment necessary.
Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.
Emergency Personnel Protection: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.
Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. See Section 13, Disposal Considerations, for additional information.
Personal Precautions: Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling
General Handling: No special precautions required. Keep container closed. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage
Do not store in: Galvanized steel. Opened or unlabeled containers. Store in the following material(s): Carbon steel. Stainless steel. Store in original unopened container. See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Propylene glycol	WEEL	TWA Aerosol.	10 mg/m3

Personal Protection
Eye/Face Protection: Use safety glasses (with side shields).
Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.
Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Yellow to green
Odor	Characteristic
Odor Threshold	No test data available
Flash Point - Closed Cup	104 °C (219 °F) *Pensky-Martens Closed Cup ASTM D 93* (based on major component), Propylene glycol.
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	**Lower**: 2.6 %(V) *Literature* Propylene glycol. **Upper**: 12.5 %(V) *Literature* Propylene glycol.
Autoignition Temperature	371 °C (700 °F) *Literature* Propylene glycol.
Vapor Pressure	2.2 mmHg *Literature*
Boiling Point (760 mmHg)	152 °C (306 °F) *Literature* .
Vapor Density (air = 1)	>1.0 *Literature*
Specific Gravity (H2O = 1)	1.06 20 °C/20 °C *Literature*
Freezing Point	supercools
Melting Point	Not applicable to liquids
Solubility in water (by weight)	100 % *Literature*
pH	9.5 (@ 50 %) *Literature*
Decomposition Temperature	No test data available
Evaporation Rate (Butyl Acetate = 1)	< 0.5 *Estimated.*
Kinematic Viscosity	43.4 cSt @ 20 °C *Literature*

10. Stability and Reactivity

Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic.
Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Avoid direct sunlight or ultraviolet sources.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers. Organic acids.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, Rat, female > 20,300 mg/kg
Dermal
For the major component(s): LD50, Rabbit > 20,000 mg/kg
Inhalation
For the major component(s): No deaths occurred following exposure to a saturated atmosphere.
LC50, 8 h, Vapor, Rat 4.1 mg/l

Eye damage/eye irritation
May cause slight temporary eye irritation. Corneal injury is unlikely.

Skin corrosion/irritation
Prolonged contact is essentially nonirritating to skin. Repeated contact may cause flaking and softening of skin.

Sensitization
Skin
For the major component(s): Did not cause allergic skin reactions when tested in humans.
Respiratory
No relevant information found.

Repeated Dose Toxicity
In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

Chronic Toxicity and Carcinogenicity
Similar formulations did not cause cancer in laboratory animals.

Developmental Toxicity
For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive Toxicity
For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.

Genetic Toxicology
In vitro genetic toxicity studies were negative. For the major component(s): Animal genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Movement & Partitioning
For the major component(s): Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability
For the major component(s): Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

ECOTOXICITY
For the major component(s): Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE

NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk
NOT REGULATED

DOT Bulk
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	No
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Propylene glycol	57-55-6	> 93.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Toxic Substances Control Act (TSCA)
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30
CEPA - Domestic Substances List (DSL)
This product contains one or more substances which are not listed on the Canadian Domestic Substances List (DSL). Contact your sales or technical service representative for more information.

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	0	1	0

Recommended Uses and Restrictions

Intended as a heat transfer fluid for closed-loop systems. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 50335 / 1001 / Issue Date 08/12/2010 / Version: 5.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.